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THE JOURNAL

OF THE

American Medical Association

Subscription, $8.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 125, No. 6

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535 North Dearborn Street, Chicago 10, Ill.

JUNE 10, 1944

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THE JOURNAL of the American Medical Association is published weekly by the American Medical Association, 535 North Dearborn Street, Chicago 10, Ill. Subscription price, $8.00 a year. 25c a copy. Canadian $9.50. Foreign $12.00. Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879.

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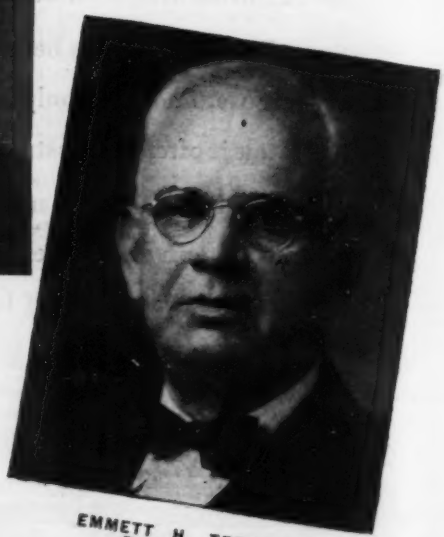

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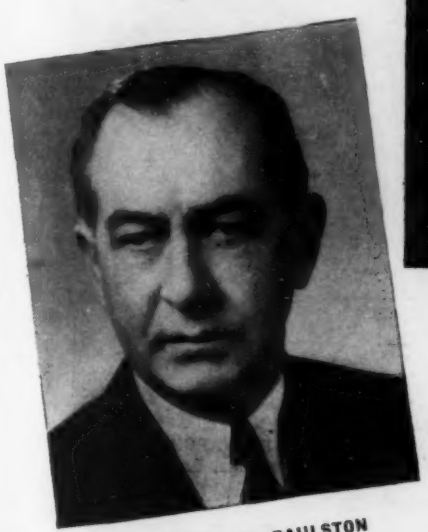

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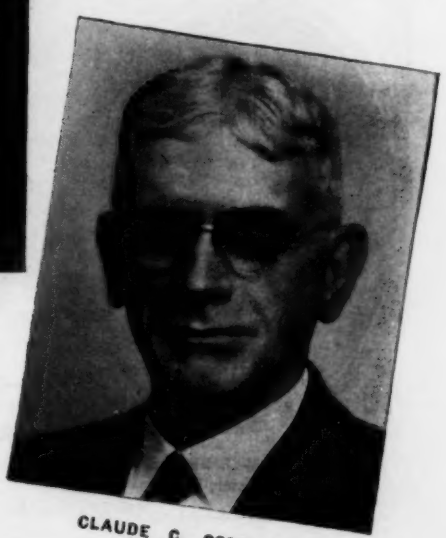

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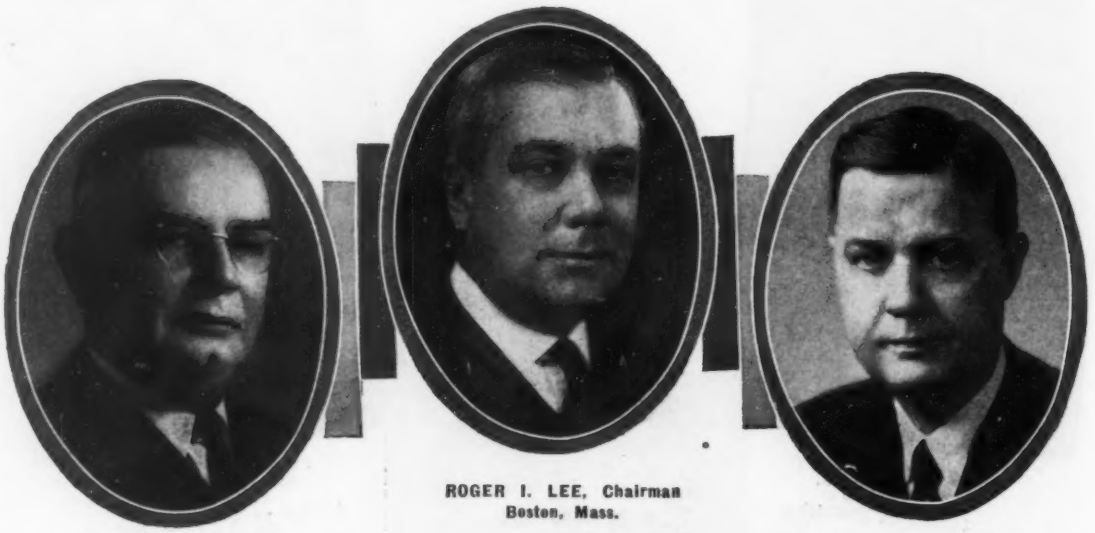

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The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 125, No. 6 — CHICAGO, ILLINOIS — JUNE 10, 1944

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THERAPEUTIC INJECTIONS IN PAINFUL MUSCULOSKELETAL DISORDERS

WITH SPECIAL REFERENCE TO THE SALINE-PROCAINE TEST

OTTO STEINBROCKER, M.D.

NEW YORK

Analgesic therapy with procaine hydrochloride and numerous other substances is being widely employed in a variety of painful disorders and has established its effectiveness in many of them.[1] Its field of usefulness has been steadily extended recently, particularly in acute and chronic musculoskeletal conditions—fibrositis (myositis), bursitis, neuritis and some arthritides.[2] Although every practitioner or student of these diseases must encounter some apparently suitable patients whose stubborn symptoms fail to respond to procaine or alcohol block, confusing differences in therapeutic results have been recorded by various investigators. The mere insertion of a needle somewhere in the region of pain, without introducing analgesic solutions, also has been reported to give frequent lasting relief.[3]

For the past several years I have been interested in ascertaining the causes of these discrepancies.[4] Naturally, a small percentage of technical failure is inherent in procedures which must be applied deeply and by precise methods, subject to the unpredictable variations of anatomy and tissue response. My purpose in this discussion is to emphasize some of the factors, apart from technic, that I have observed to present obstacles to effective analgesia, as well as sources of dramatic response to simple control measures.

DIAGNOSIS AS A SOURCE OF FAILURE

In therapeutic analgesia especially, correct diagnosis is a necessary prerequisite for successful treatment. The anesthetist or therapeutist is often asked to treat patients with a diagnosis already made. Unless the underlying condition is identified and exactly localized, however, the treatment is apt to prove ineffective. When the first and second sacral nerves are blocked for a "sciatica" which is actually a lateral cutaneous neuralgia, supplying by the 1st and 2d lumbar nerves, a disappointing outcome is inevitable.

From the Arthritis Clinic and Medical Service, Fourth Division, Bellevue Hospital, Dr. Charles H. Nammack, director.

1. Rovenstine, E. A., and Wertheim, H. M.: Present Status of Therapeutic Regional Analgesia, New York State J. Med. **42**: 123, 1942. Steinbrocker.[4]

2. Good, M.: Five Hundred Cases of Myalgia in the British Army, Ann. Rheumat. Dis. **3**: 118, 1942. Travell, J.; Rinzler, S., and Herman, M.: Pain and Disability of Shoulder and Arm: Treatment by Intramuscular Infiltration with Procaine Hydrochloride, J. A. M. A. **120**: 417 (Oct. 10) 1942. Young, D.: Effects of Novocain Injections on Simulated Visceral Pain, Ann. Int. Med. **19**: 749, 1943. Steinbrocker.[4] Rovenstein and Wertheim.[1]

3. Brav, E. A., and Sigmond, H.: The Local and Regional Injection Treatment of Low Back Pain and Sciatica, Ann. Int. Med. **15**: 840, 1941.

4. Steinbrocker, O.: Arthritis in Modern Practice, Philadelphia, W. B. Saunders Company, 1941, pp. 411-414; Some Factors in the Results of Analgesic Injections in Painful Musculoskeletal Disorders, Pan-American Rheumatism Bull. **1**: 242 (July) 1944.

In several instances I have seen a subdeltoid calcification properly but unsuccessfully infiltrated with procaine for shoulder pain. The patients presented other points of tenderness that had not been sought, or were overlooked, because the x-ray film showed a calcified deposit under the tender skin first palpated. Obvious findings, such as calcified tendons or bursae, osteoarthritic spurs or other musculoskeletal changes should not be accorded undue importance without a complete investigation and evaluation of the history and signs as a whole. Cutaneous hyperesthesia must be distinguished when present and mapped out in its entirety, if it is not to mislead one. In the complicated problem of intractable pain, diagnosis and localization of the source of symptoms require thorough, detailed examination and correct interpretation of the medical and neurologic data. An opinion from related specialties often is required.

SUBJECTIVE COMPLAINTS WITHOUT OBJECTIVE SIGNS

Although functional disturbances may be characterized by complaints not associated with definite objective signs, occasionally organic lesions too produce symptoms without localizing features. Injuries or inflammation of deep structures not accessible to palpation and unaccompanied by referred skin hyperesthesia, muscle tenderness or spasm, or limited mobility may yield no significant information to the examiner. Radiating or referred pain from a radicular or soft tissue process may be described in characteristic anatomic distribution unassociated with objective evidence of the site involved.

The only indication of the seat of trouble may be the patient's repeated and unvarying description of the type and distribution of pain. Lesions in a tendon, joint capsule or periarticular tissues may provoke pain only during certain movements. This information may be the sole clue to the source of symptoms. In these cases local analgesia can be carried out only as unguided, unpredictable therapy, since a tender site of attack cannot be demonstrated. As an index to the value of analgesic treatment in such situations, regional diagnostic block with saline solution, then procaine, is indicated, such as brachial plexus block for the painful shoulder, paravertebral or epidural injection for sciatica.

On the whole, in patients not presenting objective, localized signs susceptible at least to evaluation by local or regional saline and procaine injection, particularly in unstable individuals, analgesic therapy is fraught with uncertainty. In my experience, even when an organic lesion appears to be the basis of the subjective complaints, the lack of exact, localizing evidence forecasts a doubtful outcome for therapeutic injections.

HYPERSENSITIVITY TO PAIN

A common source of discrepancy in the diagnosis and results of pain therapy is the hypersensitivity of some persons to unpleasant stimuli. This phenomenon

has long been recognized as a factor in painful symptoms requiring evaluation before any treatment is considered. If a patient is found to have a low pain threshold, drastic treatment for localized complaints should not be undertaken hastily. A simple test, sometimes enlightening, consists in pressure over the mastoid tips (Libman[5]). In many hyperesthetic and neurotic patients it provides an index to excessive reactions. Instrumental methods have been devised to detect these subjects so that painful complaints may be properly assayed.[5] Employing some of the aforementioned means, it has been determined recently that the majority of healthy persons show normal sensitivity to pain, while there occurs an approximately equal frequency of hyposensitivity (17 per cent) and hypersensitivity (18 per cent).[6] Women displayed lower pain thresholds than men.[7]

Generalized dermal or deep hyperesthesia to ordinary palpation is a not unusual finding among senile, frail or fatigued subjects, in obese females and during the course of many systemic diseases, endocrine and nutritional deficiencies. It is often encountered also in anxiety states and in emotionally unstable persons. Since palpation of the painful part is an important sign on which great reliance usually is placed, its significance is doubtful in hypersensitive patients unless palpation of the opposite, corresponding area of the body shows a decidedly lesser reaction. When generalized or extensive abnormal sensitivity to ordinary or uncomfortable stimuli is demonstrated, useless and ineffective therapy must be avoided (case 1).

CIRCUMSCRIBED CUTANEOUS HYPERESTHESIA

Regional cutaneous hyperesthesia occurs frequently in arthritis, bursitis, fibrositis (myositis) and neuritis, but it is also found in functional disorders.[4] Its recognition and proper interpretation constitute an important step in the diagnosis and localization of the lesion in many cases. Palpation of a tender portion of skin, without observing the dermal hypersensitivity, obviously must result in false deductions as to involvement of the underlying structures. Diagnostic or therapeutic block under such circumstances often proves misleading and appears to account for many failures. I have observed avoidable disappointments of similar origin in patients subjected to radiation therapy, physical therapy and other treatment for painful disorders.

The recognition and demarcation of any skin hyperalgesia are of great importance in these conditions for two reasons: First, when unduly extensive cutaneous hypersensitivity is noted or if it is of patchy, disconnected or inconstant distribution, it may present the first clue to the psychogenesis of the disorder (case 2). In these patients tenderness to palpation of the "uncomfortable" area is found by routine examination. When, however, the skin in this locality is pinched or scratched with a pin, hyperesthesia is usually elicited.[4]

In many such persons the reference of pain is merely a conversion phenomenon associated with localized or widespread cutaneous hyperesthesia. Although intradermal salt solution is not anesthetic, a saline wheal produces relief of the previous tenderness to pressure in some such persons. In many other neurotic subjects who give a correct response to the saline solution an adjacent procaine wheal with its sense of numbness is followed by definite or complete relief of hyperesthesia and pain beyond physiologic possibilities.[8]

Another way in which dermal hyperesthesia may prove useful is in more accurate localization of a variety of somatic lesions. The hyperesthesia may arise as a symptom in a pattern of pain and soreness appearing at a distance from the site of origin, as in fibrositis about the shoulder or in intercostal neuralgia.[9] Thorough examination of the tender zones reveals the true source of the signs and symptoms, and possibly the truncal or segmental distribution of the soreness to palpation. Intracutaneous injection of the outlined tender skin with procaine eliminates the superficial hyperesthesia when pressure is again applied over the spot. The persistence or absence of deep soreness to palpation now becomes reliable evidence as to whether the underlying muscle or other structures are also tender.[10] Instead of procaine solution, ethyl chloride spray can be used to anesthetize the tender skin for diagnostic purposes. In some cases when a limited area of dermal hyperesthesia is noted it is possible to pull aside the loose, tender skin and to palpate deeply over the normal skin, now brought to the original site, to determine any underlying soreness.

The differential diagnosis of localized cutaneous hyperalgesia is beyond the scope of this discussion. It must be emphasized, however, that visceral and neurologic disease must be excluded. Such hyperesthesia may characterize lesions of the brain (notably the thalamic syndrome), spinal cord (posterior columns) and peripheral nerves.[11]

PSYCHOGENIC DISTURBANCES

The greatest source of diagnostic error and unpredictable response to analgesic therapy are the psychalgias. It is accepted that psychogenic disorders often are accompanied by diffuse, varying musculoskeletal symptoms not following any consistent anatomic distribution. Hypoesthesia or anesthesia of parts is a classic sign. Tenderness is elicited in some of these cases, but it is likely to be inconstant in degree and location, nor does it conform to any truncal or segmental pattern. The protean but typical complaints are so widely recognized that patients with this form of disorder are not apt to be subjected to analgesic block.

In contrast to the foregoing type of functional manifestations, I have encountered more frequently than is generally appreciated those psychogenic disturbances which are converted into a peripheral, circumscribed and "painful" syndrome closely simulating neuritis, bursitis, arthritis and fibrositis. This type of hysteria or of painful neurosis is more likely to be referred for analgesic therapy and contributes many of the unsatisfactory results (case 3). Diminished or absent corneal and pharyngeal reflexes are often associated.

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10. Steinbrocker: Arthritis in Modern Practice, pp. 321-323.

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Skin hyperesthesia of the part occurs frequently. Deep points of tenderness to palpation without skin hyperesthesia are sometimes found and may be accompanied by muscle spasm. Disuse atrophy is not uncommon, and disability may be severe and of long standing. Despite the limited function, some patients may show a striking absence of tenderness. The underlying emotional imbalance usually is so well masked as to evade recognition without the most delicate and searching questioning.[12] Alert, sympathetic and well directed history taking suggests or reveals the psychogenesis of the "painful" and disabling complaints. The response to the saline-procaine test frequently proves confirmatory.

It must be emphasized, however, that the diagnosis of a psychosomatic disturbance, neurosis or hysteria should not be made "by exclusion" in obscure, painful affections merely because some definite organic cause cannot be established.[12a] There still exist painful disorders in which the basis eludes the most careful investigation, at least for a time, as for example in some early lesions of malignant metastases or of nerve involvement.[11] A functional diagnosis, therefore, should be based on a distinct pattern of personal history and its relation to the symptoms and signs. When any doubt arises, neuropsychiatric consultation is indicated.

Sometimes pronounced organic disease is complicated by neurotic features. The latter may have existed previously in mild form or they may represent latent tendencies aggravated or precipitated by the severe musculoskeletal lesions, particularly when these remain chronic and unresponsive.[13] In such cases the evaluation of symptoms rarely becomes a serious diagnostic problem. On the other hand, some patients present definite but minimum evidence of organic changes at the site of pain, such as roentgenologic signs of osteoarthritis of the spine. Associated with the meager objective findings are symptoms so stubborn and disproportionate that a predominantly functional basis is suspected. Evaluation of the somatic and psychic components in the complaints may pose a delicate clinical problem. The patient then, by all therapeutic means, should be given the benefit of the doubt. Even when the psychogenesis of the symptoms is not clearcut at first, conflicting or extreme response to analgesic therapy may provide revealing information (case 4). The saline-procaine test is a useful preliminary here.

Among patients in this group the reaction to treatment is extremely variable, depending on the severity of the neurosis and on individual suggestibility. In many of the mild psychogenic disturbances, therefore, a seemingly satisfactory response may be elicited by even a simple but impressive procedure, whether it is the mere prick of a hypodermic needle at the site of pain or the actual injection of medication. More deeply rooted psychoneuroses in less suggestible subjects prove refractory to procaine or alcohol block.

I have given some of these patients courses of saline injections with "better" results than anything in the gamut of therapy they had run. While such placebo therapy seems curative of some psychogenic complaints, if the patients are followed long enough the symptoms often are seen to recur or to be transferred to another organ or peripheral area (case 5). In the same way following apparently successful nerve block or other analgesic therapy, the complaints are apt to return sooner or later in many of these individuals.

In the diagnosis and evaluation of therapy in painful disorders it is sometimes stated that the previous unsuccessful treatment of whatever variety proves the organic intractable nature of the ailment and constitutes a form of control for any further therapeutic procedures. My experience does not confirm this point of view. The soundest approach to the medical study of these patients, in my opinion, requires the use of control methods which are technically and psychologically analogous to the therapy given, such as saline infiltration at the site of pain or treatment as a preliminary to the therapeutic block.

THE SALINE-PROCAINE TEST [13a]

The saline-procaine test offers a simple, frequently valuable diagnostic aid in these cases. When used routinely, more satisfactory selection of cases for analgesic therapy and more dependable results should follow. This procedure is employed only when palpable tenderness is a feature of the complaints, as in neuritis, fibrositis (myositis), bursitis and some articular disorders. The saline-procaine test consists in the consecutive injection of isotonic sodium chloride and procaine solutions at the site of soreness elicited by palpation, and the judicious evaluation of the patient's response. In some subjects injection of either of these substances may give sufficient confirmation. The proper combination of saline and procaine infiltration, however, often yields diagnostic information otherwise not readily obtained. Of course this procedure does not constitute a precise, specific reaction and, at best, can serve only as an aid to clinical judgment in the evaluation of symptoms.

The saline-procaine test is performed essentially in the same way in all peripheral painful conditions. The presence of overlying skin hyperesthesia having been excluded, the point of maximum tenderness is located, or a trigger point may be found. After a skin wheal has been made with procaine solution over any of these points, it is penetrated with a needle and 2 to 3 cc. of isotonic solution of sodium chloride deposited subcutaneously. The spot is palpated again in ten to fifteen minutes.

When the symptoms continue after the saline infiltration, a needle (22 gage, 1½ inches) is directed through the skin wheal until the original pain is reproduced, as happens at a trigger point.[14] More often, I find, the pain is not duplicated. Then the needle is advanced at the center of the tender area to a reasonable depth where 5 to 10 cc. of the procaine hydrochloride (1 per cent) solution is injected.

The hypodermic use of saline solution as a control test of the veracity of painful complaints is too well known for discussion. Local or regional saline injection at the site incriminated by the patient or at the point of maximum tenderness offers a more effective approach. It should constitute the first step in care-

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12a. Savitsky, N.: Personal communication to the author. Wortis, S. B.: Personal communication to the author.

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13a. Steinbrocker, O., and Kuhn, P.: The Saline-Procaine Test in the Differential Diagnosis of Functional and Somatic Disorders, presented by title, clinical research meeting, New York Academy of Medicine, May 27, 1943.

14. Steindler, A., and Luck, J. V.: Differential Diagnosis of Pain Low in the Back, J. A. M. A. **110**: 106 (Jan. 8) 1938.

fully conducted treatment of certain acute and chronic, painful conditions (cases 3 and 5). These procedures assist in the understanding and detection of functional disorders which respond dramatically, frequently relapse or prove entirely refractory, whether procaine injections, alcohol block or other analgesic measures are employed. Following saline infiltration psychogenic disorders frequently are verified by immediate relief of symptoms—absence of the former "pain" and tenderness to palpation as well as alleged uncomfortable or limited mobility. Of course, failure of a patient to be influenced by this procedure does not exclude a psychogenic basis for the symptoms.

The supplementary use of procaine injection, when it affords relief to a patient uninfluenced by saline infiltration, usually confirms the somatic basis of the complaints. This response is evidenced by moderate to complete abolition of pain, tenderness to palpation, uncomfortable mobility of the part and other positive signs within ten to fifteen minutes (case 6). Sometimes a functional disturbance reacts normally to these substances. Under further observation with analgesic injections, however, the complaints return as soon as the suggestive influence of the new line of treatment no longer prevails.

When neither saline nor procaine solution is effective, provided the involved tissues are not beyond reach of the medication, a severe conversion syndrome or malingering is strongly suggested (case 7). Unless the basic emotional conflict happens to be resolved during the course of treatment, in the latter cases parenteral injections are likely to prove useless eventually even as a form of psychotherapy (case 4). Neuropsychiatric consultation and intensive psychotherapy are indicated.

The following representative case histories illustrate the observations that have been made. Although a thorough physical and laboratory study was carried out routinely, only essentials are mentioned.

REPORT OF CASES

CASE 1.—*Extensive hyperesthesia in anxiety neurosis simulating brachialgia.*

E. R. was seen because a brachial plexus block was recommended for her painful shoulder. She was a bedridden, decompensated cardiac patient who had complained increasingly of pain in the left shoulder region accompanied by tenderness and limited mobility apparently of very troublesome severity. The cardiac status had been improving, nevertheless, according to clinical signs and laboratory data. Locally there was exquisite tenderness to palpation in the left neck area and about the shoulder, as well as the restricted mobility of the extremity for which the block had been suggested.

Examination of the part seemed to confirm the impression that a circumscribed, painful disability was present. On complete investigation, however, extensive hyperesthesia on one side of the body was found. The corneal and pharyngeal reflexes were almost absent. Questioning of the patient disclosed a deep apprehension over her prognosis and at the prospect of going home, where little or no care was available. Assurance was given that the pain would leave her and motion of the extremity return. The complaints soon subsided and the widespread hyperesthesia had disappeared when the patient was discharged. On a subsequent admission the same series of symptoms developed and responded similarly without analgesic therapy.

CASE 2.—*Conversion hysteria simulating a somatic disorder with multiple, extensive skin hyperesthesia.*

H. D., a mechanic aged 48, entered the hospital for severe pains in the left flank. The pain had existed for about two months but became acute and disabling in the past few days, according to the patient. A language difficulty made a detailed history difficult to obtain. General examination was unrevealing. Locally, tenderness and muscular rigidity to palpation were elicited in the left upper quadrant of the abdomen as well as at the left flank and at the left costovertebral angle. Some tenderness was found in the left lower quadrant too. Accordingly, on admission, an acute renal lesion with urinary retention was suspected. Later a lumbar myositis was considered.

Examination revealed the tenderness already noted. In addition similar soreness to palpation was demonstrated over the right sacroiliac and gluteal areas. Skin hyperesthesia was exhibited to pinch and scratch tests in all of the tender regions. It extended from the 8th dorsal vertebra on the left side to the upper gluteal area around the left side of the abdomen, particularly in the upper half; also in the right sacroiliac and gluteal areas. The widespread cutaneous hypersensitivity and its multiple distribution suggested a functional basis. The corneal and pharyngeal reflexes were absent. Intradermal infiltration of 2 cc. of intracaine solution abolished the tenderness at the site of injection, where deep palpation no longer provoked any tenderness.

X-ray films of the spine, as well as other relevant data, were negative. A detailed history revealed that the patient lived with his son, with whom he was in constant and violent disagreement. Their repeated quarrels were punctuated by alcoholic bouts. Sedation was prescribed. The patient was kept under observation for sixteen days, during which time the symptoms subsided. He was referred to the Mental Hygiene Clinic.

CASE 3.—*"Neuritic" symptoms responding to local saline injections.*

Mrs. T. R. was referred for a painful hip with troublesome pain radiating along the anterior surface of the thigh. The complaints had lasted about seven months. One month after onset the patient consulted a gynecologist. A fibroid uterus was found, and a hysterectomy was performed. The symptoms were somewhat relieved for several weeks after the operation, but they became increasingly severe thereafter.

On examination the only objective findings were localized tenderness in the inguinal area, which was the most troublesome to the patient, and some deep soreness to palpation in the right femoral region without skin hyperesthesia. The x-ray films were negative. A femoral neuralgia was suggested. As a preliminary to treatment, through an intracutaneous procaine wheal 5 cc. of salt solution was deposited subcutaneously at the inguinal tender area. Within a few minutes the tenderness to palpation was almost completely absent.

On close questioning it was brought out that the patient was greatly concerned over her husband's behavior toward her. She received two similar injections three days apart, with almost complete relief of all symptoms. One week later she returned with severe pain, which came on after a friend warned her of seeing her husband having dinner with a strange woman. She did not "dare risk finding out the awful truth" by discussing the matter with her quick tempered husband. She was urged to reserve any conclusions until she had a frank talk with him.

The patient returned in a week in a happier frame of mind as the result of a satisfactory explanation which proved her suspicions completely unfounded. There was still just a slight pain, for which she requested treatment until it was "absolutely gone." Three additional subcutaneous injections of saline solution were given. On checkup three months later, the patient had remained free from any symptoms.

CASE 4.—*Conflicting and extreme response to analgesic injections in a conversion syndrome.*

Mrs. R. N. was referred for block of the 12th dorsal and 1st lumbar nerves for inveterate neuritis. Palpation did elicit discomfort approximately in the distribution of these nerves. Tenderness of the lower abdominal wall was striking. Pain and soreness were said to have persisted intermittently for about twelve years. Two abdominal operations had been performed for complaints associated with the pain. The 12th dorsal and

1st lumbar nerves were injected paravertebrally with 5 cc. of procaine hydrochloride. That evening the patient reported the first complete absence of pain in several years.

Three days later, when she returned for further treatment, owing to the excessive response the procedure was repeated without change. The patient reported after the same interval that her pain was worse than ever. Accordingly, when she appeared again in several days her emotional status was carefully investigated. She soon launched into a tearful story of emotional conflict due to the infidelity of her husband. For years these emotional disturbances evidently had produced conversion symptoms. The patient was returned to her physician for psychotherapy. Three months later she was reported to be completely free from pain following the start of legal action to solve her domestic problem.

CASE 5.—*Psychosomatic disturbances in a patient with organic changes.*

L. R., a widow aged 51, was returned to the arthritis clinic for low back strain related to an old arthrodesis of the left hip. Examination had disclosed localized tenderness over the left sacro-iliac joint apparently aggravated by motion of the left lower extremity and by flexion tests. The patient's record in the outpatient department consisted in attendance at a number of different clinics for a variety of complaints. For her diffuse pains of many years' duration, and the osteoarthritic joint changes seen in her x-ray films, she had been referred finally to the arthritis clinic. At that time her complaints were not located in the low back.

She had then received two courses of high voltage x-ray therapy for her osteoarthritis, several courses of physical therapy with different modalities and a variety of medication, including regular parenteral estrogenic therapy with large doses of diethylstilbestrol. Study of the patient and her medical history convinced me that the vague shifting musculoskeletal symptoms, associated at times with similar visceral complaints, were related to the anxiety state which she exhibited. A series of subcutaneous injections of isotonic solution of sodium chloride twice weekly gave her sufficient "relief" to discontinue treatment.

The new complaint of acute back pain over the left sacroiliac joint appeared about one month after her last visit to the clinic for saline injection. The location of the latest pain and the circumscribed tenderness adjacent to an old incompletely fused hip with its shortened extremity made an almost convincing picture of saroiliac strain.

In view of the patient's background and the exquisite cutaneous hyperesthesia which accounted for the tenderness elicited by all the examiners, a subcutaneous saline injection was given as a preliminary to analgesia. Within five minutes the local tenderness was gone and uncomfortable mobility of the extremity was abolished.

The patient returned two weeks later, when she stated that she had experienced two days of complete relief from her symptoms. The discomfort recurred then in "mild" form and gradually disappeared. At this time the left low back was no longer troublesome, but pain and tenderness had developed on the right side at a corresponding location. Following a subcutaneous injection of saline solution the complaints and signs again vanished within five minutes. The patient had been referred previously to the Mental Hygiene Clinic, and a similar disposition was again made.

CASE 6.—*Somatic pain with typical response to saline solution and procaine.*

M. F., a woman aged 40, married, a business executive, came in for relief of pain in the right deltoid area of sharp, burning character. The pain began eight months earlier following a hypodermic injection by a hospital nurse the day after a hysterectomy for a fibroid uterus. The patient experienced an ache at the site of injection immediately, and it continued to appear intermittently for four months with increasing and longer lasting severity. During the four months before presenting herself, the pain had become more or less constant. It had begun to be associated with sharp and burning radiation along the radial border of the extremity to the outer fingers of the hand. In the past month the patient had noticed that she was favoring the extremity, so that there was great limitation of the amount of work done with the arm. Insomnia due to pain had become troublesome.

The patient seemed to be happily married and enjoyed her work. She displayed a calm, cheerful disposition. The only abnormality was found at the lower deltoid area. There a circumscribed, deep point of tenderness to palpation by the finger tip was elicited. Pressure at this tiny point provoked exquisite soreness and reproduced some of the uncomfortable radiation. Infiltration of saline solution (2 cc.) subcutaneously gave no response. Deep injection of saline solution (2 cc.) provoked soreness, and the tenderness to palpation remained. In ten minutes 5 cc. of procaine hydrochloride solution (1 per cent) was introduced at the same depth. Ten minutes later the tenderness had disappeared. The patient was comfortable for two days. Three similar injections of 10 cc. of procaine solution at intervals of four to seven days were followed by complete relief of complaints and disability. The patient has remained symptom free for eleven months.

CASE 7.—*Unresponsiveness to procaine at a "tender" site in a compensable disability.*

H. G., a tailor aged 64, had been treated for atypical rheumatoid arthritis of the right wrist, which subsided without demonstrable residual change. He returned to the clinic for a painful shoulder of two months' duration. Moderate limitation of extension and posterior rotation seemed to exist. Almost complete, but apparently uncomfortable, passive motion could be carried out. No atrophy was noticeable. Deep tenderness was elicited in the coracoid area. X-ray films of the shoulder were negative, but the cervical spine showed moderate osteoarthritic changes.

The patient had received medication and a course of physical therapy without relief, he stated. Local injection of isotonic solution of sodium chloride at the tender site was ineffective. Deep injection of 10 cc. of procaine hydrochloride did not influence the pain and tenderness. Repeated local injections of large quantities of procaine, brachial plexus block via the supraclavicular and scalenus routes and injection of the scalenus muscle failed to affect the symptoms.

These procedures were used at weekly intervals for two months, when it was decided to review the history and to repeat the general physical examination. In the course of getting a more detailed history it was established through a chance remark of the patient that he had been receiving disability compensation and that it would be available for another month. It was his sole source of income. He was told to return in two months if his symptoms were still present. He did not return.

SUMMARY

The results of therapeutic analgesic injections and other methods of treatment for intractable pain depend on a number of factors, apart from technic. Among these are:

1. Correct diagnosis and localization of the source of pain.

2. Selection of suitable patients by excluding those with only subjective complaints, unless regional diagnostic block is effective.

3. Recognizing hypersensitive individuals, psychogenic disturbances (painful neuroses, conversion syndromes) and evaluating response accordingly.

4. Detection and proper interpretation of cutaneous hyperesthesia.

The saline-procaine test is recommended as an aid in the diagnosis and selection of patients suitable for therapeutic local and regional injections

121 East 60th Street.

THE PHYSICIAN'S OPPORTUNITY TO HELP OLDER PEOPLE

E. V. COWDRY
ST. LOUIS

Peru, under the Incas, was the first great American socialistic state. Food production and labor were controlled in the interest of the whole, and age levels were recognized for males. Those over 50 were not required to pay taxes or to do any work, while the privilege of men over 60 was to sleep as much as they liked. The females were ignored.[1]

In our country a very different solution is being worked out. Instead of encouraging irresponsibility, idleness and consequently early death of the aged the policy is to promote responsibility, activity and the will to live. But the socially useful services performed by them must be adjusted to their changing capacities. In doing this doctors must play the leading role.

The chief obstacle is the power of the old age taboo. Some young people hate to think of the aged, are even uncomfortable in their presence. They would rather remain ignorant of the adjustment to advancing years that they themselves must make than be informed. Physicians are for the most part silent, despite the fact that many are well advanced in years. In 1930, 10.2 per cent of physicians were 65 years or over, while 10.8 per cent of clergymen were in the same category.[2] So strong is the avoiding impulse that it is not easy to obtain a hearing on the problems of aging. Yet it is a task not without interest to weigh the available evidence and to try to visualize the increasing opportunities for service by the medical profession.

RISING TIDE OF AGED

Because the rising tide of the aged in our population is gradual we may not quite realize its volume. Pediatricians are among those most alive to this change. Since they deal with the upswing of life they are also interested in the downswing, in which some curiously similar phenomena are manifest in the reverse order.

The percentage of individuals in the upswing, that is up to 19 years of age, was 34.5 in 1940. The percentage predicted by Thompson and Whelpton for 1970, twenty-six years hence, is only 27.3. Consider now the downswing, persons of 45 years and over. It is expected that these will increase from 25.5 per cent in 1940 to 37.7 per cent in 1970.[3] Evidently the numerical opportunities as to patients of the pediatricians presiding over the upswing are decreasing; while those of the geriatricians, charged with the downswing, are increasing.

It is a fact that in the brief space of ten years from 1930 to 1940 the number of people 65 years old and older in the United States increased 2,322,401. This is more than twice the number of men, women and children in the state of Oregon, the total population of which was 1,089,684 in 1940. Moreover, the percentage of the whole population of individuals in this age group in 1940 was predicted in advance as likely to be 6.3. When 1940 rolled around the percentage was found to be 6.8. This gives confidence in the conservative nature of the predictions.

Aside from this relative and absolute increase in the number of older people, there is another consideration which may have bearing on the age of many seeking medical aid. As before, veterans of all kinds will be treated with great generosity, and provision may be made for their free medical care in federal institutions. In his annual report (Jan. 13, 1944) Brigadier General Hines, Administrator of Veterans Affairs, states that the accredited U. S. military population consequent on this war is expected to be 14,271,720 and that 300,000 hospital beds will be required. Evidently most of these millions will be in the age group 20-45. If they are to be treated free by Uncle Sam, and many avail themselves of this privilege, the percentage of persons relying on private practitioners who are 65 and more will not be a little over 6.8 but will be for some years considerably greater because so many of the younger ones will be cared for by the government.

INCREASING PROPORTION OF WOMEN

It is likely that most of these old persons will be women. Figures presented by Dublin show that in 1939 the expectation of life for all decennial ages was greater for white females than for white males and the mortality rates lower. Doubtless the reasons are many; but it is to be expected that the adjustment which must be made on retirement weighs very heavily on men. From the status of employers, even though it may be in but a small way, they return to the home and become employees. The women, on the contrary, do not suffer uniformly such a sudden change. Most of them continue as employers in the familiar home environment with only gradually tapering authority—a difference that should not be lightly passed over.

The 1940 U. S. Census shows that in the past decade the excess of males over females suffered a particularly sharp decline. It was 2,692,288 in 1910, 2,092,242 in 1920, 1,500,114 in 1930 and 453,919 in 1940. The hope expressed in some quarters that the supposedly greater production of boy babies in wartime will operate temporarily to stem the decline in males is probably without foundation. The ratio of boy to girl babies born in the St. Louis Maternity Hospital has been for many years 105:100. No increase on the male side has taken place. There is, however, another factor which will decrease the proportion of males seeking aid from private physicians. It is that a steadily increasing percentage of males will in all likelihood avail themselves as veterans of medical service provided by the government.

MEDICAL SERVICE OF THE AGED IS PARTICULARLY EXACTING

No one will question the fact that it is more of a task adequately to look after 100 aging patients of 65 and over or even of 45 plus than it is an equal number of adults 20-45 years of age. In attempting to estimate the difference, several points stand out.

It has been wisely said "that the boy is not a little man." It is equally true "that the senile is not simply an old man." He is practically another person gradually reconstructed in the same general form and must be treated as such. Certainly most of his structural materials have been replaced, some of them repeatedly.

Read before the Portland (Ore.) Academy of Medicine, March 10, 1944.
From the Anatomical Laboratory, Washington University, and the Barnard Free Skin and Cancer Hospital, St. Louis.
1. Wissler, C., in Cowdry, E. V.: Problems of Ageing, Baltimore, Williams & Wilkins Company, 1942.
2. Miles, W. R., in Stieglitz: Geriatric Medicine.[6]
3. Dublin, L. I., in Cowdry's Problems of Ageing.

The whole trend of recent studies with radioactive isotopes, as well as with substances tagged in other ways, is to show the wide extent of this replacement. It is true that some individual cells live for a long time, but we may look to the time when replacement of their constituents will also be proved. Perhaps the greatest burden is failure regularly to get rid of aged elastic fibers and systematically to replace them with new ones.

The senile is also of smaller size, owing to atrophy. Some of his tissues are made up of fewer cells (nervous system), others show localized hyperplasia (skin), while still others are hypertrophied (prostate, arteriolar walls). He works with a different background of experience under higher blood pressure and at a lower metabolic rate. He is handicapped by decreasing efficiency of homeostatic mechanisms and by maturing nutritional deficiencies and excesses and probably by tissue ischemia. A new concept is the idea that his tissues do not merely dry up with the advancing years but tend to become waterlogged.[4]

Among the aged there is greater diversity than in earlier life because hereditary traits and internal and external environmental factors have operated for a longer time. Precocious aging of the skin is seen in xeroderma pigmentosum and almost of the whole body in Simmonds' disease and progyria. Delayed aging is exemplified by the 625 gallant veterans of the Union Army, whose average age in 1944 was 97. Because of this diversity the aged must be treated as individuals, not *en masse*. Case histories are always more troublesome to take than those of younger persons, and diagnosis presents many special difficulties.[5]

Since the aged are no longer on the high plateau of efficiency, their abilities are waning. Therefore the problem of physical and mental adjustment assumes greater proportions. Medical guidance must be continuous through the years, just as a single pediatrician should have charge over a growing child until adulthood. But the job is heavier for geriatricians than for pediatricians for the reason that their patients are on the downward path, do not naturally grow out of ailments but progressively tend to get worse. A survey by the U. S. Public Health Service[6] shows that the percentage distribution of invalidism increases to a peak of 19.1 in the group 65-74 years old, whereas it falls to 10.7 in the 74 + group, which indicates again that the constitutionally rugged tend to survive.

In older persons not only is there more invalidism but the cumulative effects of dietary deficiencies and excesses become manifest, and deaths from cardiovascular-renal disease and cancer dominate the picture. Persons suffering from these conditions require much attention. Geriatricians, more than any other physicians, have to preside over death. This is not pleasant and intensifies the taboo.

And there is the chance of not having one's bills paid. Geriatricians should charge more per patient than physicians caring for younger persons because they should have fewer of them and give more to them. But bills are never paid by persons who do not primarily benefit by the service rendered as enthusiatically as those who are themselves helped. The gratitude of old people is often touching. This, however, is not enough. To live on a practice in which there are many aged dependent persons is consequently hazardous. The actual extent of dependency has been clarified by a survey of 7,800,000 persons of 65 years and over made by the U. S. Social Security Board. The total number now in this age group is in the neighborhood of 9,000,000, so that the results are significant. It was discovered that 3,480,000 were dependent on friends or relatives, 1,590,000 were supported wholly or partly by public or private social agencies, while only 2,746,000 were financially independent, living on pensions, annuities or savings.

THE CHALLENGE

How is the medical profession going to meet the challenge? It can give leadership instead of simply waiting for things to happen. Indeed it must give constructive leadership or else be forcibly socialized. No university medical school worthy of the name can longer afford to graduate doctors who have not had enough training in geriatrics to appreciate the opportunities in this field and to specialize in it after graduation, if they feel the call, which will depend largely on an enlightened attitude on the part of their teachers. Medical education must qualify doctors to care for the medical needs of the whole population, not forgetting the more than 25 per cent past 45 years old and on the downward path. At present this training is unorganized. The students get a little here and a little there. Too often they drift into the attitude that many of the complaints of elderly persons are imaginary, that with advancing years illness is to be expected, and that this is only natural anyway because one can't prevent aging.

HOW TO MEET IT

Geriatrics should be dignified by special and intensive instruction as in the other divisions of medicine. This means that space should be made in an already congested medical curriculum for a comprehensive course in the subject by reducing instruction in something else, which involves the kind of self denial for which faculties of schools of medicine are not noted.

Hard headed deans are likely to resort to delaying tactics. They will ask the perfectly legitimate question What would be the content of such a course? Setting details aside, there will probably be general agreement that it should give an integrated view of the changes in the body both structural and functional in the downswing of life. It should review the disturbances and maladjustments most likely to develop and the special difficulties encountered in diagnosis and treatment. By the study of cases it well might show how greatly aging people can be helped to make the greatest of all adjustments.

The most practical way to plan the course would be to delegate responsibility to a committee consisting of the professors of medicine, psychiatry and pediatrics and any members of the faculty particularly interested in geriatrics. Geriatricians are likely to develop from internists and general practitioners. Both have a lively understanding of the importance of preventive medicine, and it is in geriatrics that long term prevention should be cultivated. The training in personality development will dovetail with that in psychiatry. Psychology looms large, as does also occupational therapy and nutrition. The advice of pediatricians will be helpful, for the unfolding has much to do with the folding up of the individual, and pediatricians, like geriatricians, appreciate better than others the changing influence of age.

4. Lowry, O. H., and Hastings, A. B., in Cowdry's Problems of Ageing.
5. Mueller-Deham, A., and Rabson, S. M.: Internal Medicine in Old Age, Baltimore, Williams & Wilkins Company, 1942.
6. Stieglitz, E. J.: Geriatric Medicine, Philadelphia, W. B. Saunders, 1943.

The next question might take the form of a suggestion: Well, why not have an optional course and see how it works? That would hardly be satisfactory. It would leave to individuals to decide whether they will or will not experience a little training in the special medical needs of an increasing fraction of the population, and the old age taboo might operate to reduce the volunteers to the vanishing point.

The final question might be in the nature of a declaration, perhaps with a sigh of finality: You can't find persons qualified to take charge of the course, whether it is optional or required! One must admit a dearth of desirable candidates, but the admission is itself an indictment of medical education. It is for us not to be complacent in their scarcity but to produce them.

Not long ago it became clear to leaders in the profession that psychiatry, which was then far behind that in Europe, should be purposefully cultivated in this country. The Rockefeller Foundation blazed the trail by establishing fellowships in order to train carefully selected individuals showing promise of ability to become key men in psychiatry. It would seem logical to make provision for similar training of geriatricians. Certainly the increasing demand for them is greater, and each could be strategically placed in charge of a course in the regular medical curriculum. Universities, blessed with a vision of all that is involved, might well initiate some such fellowships without outside aid, for the cost would be small. Among the applicants might be a few alert women, for women serve with conspicuous success in the related fields of pediatrics and psychiatry.

But larger funds are needed, because these fellows will have their eyes to the future and will not even accept appointment unless there are enticing opportunities for advancement in research, in the clinic and in practice if they make good. Again we come up against the taboo already mentioned. Public spirited citizens, able to help financially, are simply not interested. When I cautiously broach the question they look at me strangely, answer politely and wonder what's wrong with me. When pressed they quickly change the subject or pass the buck to Uncle Sam and remind me of the federal security act of 1937, under which our legislators are placing millions in the hands of the aged: $325,000,000 was appropriated for the current fiscal year. They smile when I say that these millions quickly pass into other more nimble hands eager to receive them, and the conversation definitely ends. Aged persons who are poor do need many things, among which one is expert medical care. It would be direct and to the point to see that they get it by earmarking a certain small percentage of the total for payment of doctors' bills and second by using a still more minute percentage to improve the medical service rendered by training in geriatrics and research in our universities.

An attempt is slowly being made to get out of this wilderness. The Josiah Macy Jr. Foundation has blazed the trail. The National Research Council has established a committee on aging under the chairmanship of Dr. William deB. MacNider which could administer research funds and fellowships to advantage, because it is truly national in scope. The U. S. Public Health Service has developed a subdivision of gerontology and has made a detailed survey. In so doing Surgeon General Parran was ahead of public opinion, still unfortunately trying blindly to buy a way out by dispensing from the federal chest the charity millions referred to supplemented by grants from the several states. Great things are to be expected from the Public Health Service. Let us remember that it was the Surgeon General who recognized the need for better training of cancer specialists and for research on cancer, and that the enabling cancer act advanced by him was unanimously passed by Congress. The medical profession will, I am sure, put its shoulder to the wheel. Standards must be established and maintained. Perhaps we shall soon see an American Board of Geriatrics.

Two factors make the problem acute. There is no doubt that with hundreds of thousands of people shifting their residence from place to place the older ones suffer and become confused. It is clear also that, in the mushroom growth of little houses providing only space for very small families, old persons are being squeezed out. Sociologists and economists and many others are involved. The Old Age Assistance Division of the New York City Department of Welfare already cares for 55,000.[7]

Public opinion must be mobilized and given expression. I should like to see the American Medical Association propose to the Brookings Institution of Washington that they should together survey the problem, bring out the facts, make recommendations and publicize them. If this is not feasible I hope that the Association, with the backing of the National Research Council, will approach some new foundation which is formulating its program and explain the situation to the end that the fundation will dedicate itself to this problem and prepare a report which will lead to unanimous and wise action by Congress and state legislatures. Every man, woman and child in the United States is involved.

The philosopher John Dewey has made a statement which can be considered our social Magna Charta. He says that the basic human problem requires for its solution "changes which ensure first to every individual the continual chance to have intrinsically worthwhile experience, and secondly provide significant socially useful outlets for the maturity and wisdom gained by experience." The continual chance, even in advancing years, to have worthwhile experience can add zest to life and, to make use of this experience for the good of others, can give a feeling of accomplishment. It is the privilege of the medical profession to lead into this promised land.

Scott and Euclid avenues.

7. Lawton, G.: New Goals for Old Age, New York, Columbia University Press, 1943.

Epidemics.—Epidemics are like waves: they rise and fall. Sometimes they seem to be spaced at fairly regular intervals of time. Measles seems always to be present in certain places; this persistent unspectacular prevalence is called endemic. Topography and climate seem to have something to do with both epidemics and endemics. We have seen how Hippocrates and, in our own country, Daniel Drake wrestled with this problem. Ophthalmia is traditionally associated with Egypt, malaria with the Mediterranean shores, plague with the East, yellow fever with the tropics of America. Moreover, some diseases spread and become threatening at one season of the year, some at another. Pneumonia is a winter disease, measles seems to reach its peak in the spring, babies die of diarrhea in the hot months, and one fears poliomyelitis most in the late summer. Some diseases, again, fall on people of all ages, some on children, some most severely on the old.—Smith, Geddes: Plague on Us, New York, Commonwealth Fund, 1941.

GREASE GUN INJURIES

JOHN JOSEPH BYRNE, M.D.
Instructor in Surgery, Boston University Medical School
BOSTON

Hand injuries caused by the injection of grease under pressure have been previously reported. Smith [1] presented the case of a mechanic who accidentally injected grease under 7,000 pounds of pressure into the volar aspect of the base of the left index finger.

The finger became numb immediately and 4 cc. of thick grease could be expressed from the small wound of entry. The next day the hand became swollen and intensely painful. Under gas-oxygen anesthesia, lateral incisions through the pulp along the middle and proximal phalanges were made and 15 cc. of grease was expressed. Several days later the hand was washed with ether in an attempt to wash out the grease. On the ninth day the finger was so gangrenous that a disarticulation was performed and 45 cc. of grease was milked down from the palm and wrist. The wound eventually healed.

Brooke and Rooke [2] reported 2 more cases:

1. A man aged 27 injected grease in his finger tip. The finger became numb and swollen immediately. It was given expectant treatment consisting of bed rest, warm soaks and, finally, operative incision. The finger drained some pus for a while until a sequestrum separated and then healed.

2. A man aged 36 injected grease into the tip of the left index finger. The finger became numb, dead white and a little swollen. Grease could be seen down to the middle joint. A small incision was made on the finger tip at the site of the small puncture wound, but no grease could be expressed. On the fourth day the finger became indurated and black down to the terminal interphalangeal joint. It doubled in size on the ninth day with the skin on the plantar and dorsal surface being separated from the underlying tissues by a watery fluid down to the midphalangeal joint. The next day this epidermis was removed, and recovery of the finger slowly took place.

Mason and Queen [3] discussed 2 cases which were observed many months after the injury:

1. A man aged 23 accidentally released the pressure while repairing high pressure grease equipment. The grease penetrated some rags and entered the left hand, causing it to become swollen. A pin point perforation was present in the palm just proximal to the web between the index and middle fingers, and a light tan discoloration was present over the area of the swelling. A physician incised the hand at the site of injury and squeezed out as much grease as possible. The incision healed in two or three weeks. A small "boil" developed in one month at the perforation site, and pus (?) was expressed on several occasions. Subsequently hard, tumor-like masses developed at the base of the index finger and up into the palm. These tumor masses and the overlying involved skin were painstakingly excised in toto from the underlying tendon sheaths and digital nerves and vessels. A free full thickness graft was placed in the defect and the wound healed.

2. A man aged 26 had grease blown into the tip of his left index finger from a grease gun accidentally discharged at a distance of 8 inches. Immediate swelling occurred. From a small, dotlike puncture wound on the finger tip some grease was evacuated by the patient. Swelling persisted in the finger and one week later a small incision was made, but no foreign material was expressed. The wound healed in several weeks. One month later the finger tip was slowly enlarging and becoming hard. Six months later the volar surface of the distal phalanx was very hard and enlarged and a few small pitting scars were noted at the distal end of the phalanx. This tumor was removed with the overlying involved skin, and the defect was repaired with a small pedicle graft.

From the Third Surgical Service, Boston City Hospital.

1. Smith, F. H.: Penetration of Tissue by Grease Under Pressure of 7,000 Pounds, J. A. M. A. **112**: 907-908 (March 11) 1939.
2. Brooke, R., and Rooke, C. J.: Two Cases of Grease Gun Finger, Brit. M. J. **2**: 1186 (Dec. 16) 1939.
3. Mason, M., and Queen, F. B.: Grease Gun Injuries to the Hand, Quart. Bull., Northwestern Univ. M. School **15**: 122-132, 1941.

REPORT OF AUTHOR'S CASE

F. C., a white man aged 54, accidentally injected an unknown amount of medium weight truck body grease into his left fourth finger while greasing a truck. Immediate numbness and swelling resulted, and he quickly soaked his finger in warm water. An hour or so later he went to the accident floor of the Boston City Hospital, where a small incision was made on the palmar aspect of the distal phalanx. A small amount of grease was pressed out of the wound, and warm soaks were advised. In the evening of the next day his fingers and palm began to swell. On the third day intense throbbing pain forced the patient to enter the hospital.

Local examination revealed swelling over all the fingers and palm of the left hand. The fourth finger was most involved, with the skin very tense and red. Near the finger tip were two small wounds, one the site of injury and the other the site of the incision. Both wounds were free from exudate. There was a light brown discoloration, apparently subcutaneous grease, scattered in patches over most of the surface of the finger. Anesthesia was present in the finger tip, and motion of the finger was considerably limited.

The patient's temperature was 98.6 F., the pulse rate 70 and the respiratory rate 20.

Examination of the blood showed a white cell count of 7,600 and a red cell count of 4,200,000 with a hemoglobin of

Fig. 1.—Appearance of left fourth finger six days after injury, showing the blue-black discoloration in the distal half. The small wound on which there is a small drop of serum was made in an attempt to remove some of the grease. The other wound is the original site of injury.

80 per cent. The blood sugar was 78 mg. per hundred cubic centimeters, the nonprotein nitrogen 29 mg. The Hinton reaction was negative.

The patient was put to bed, and massive warm packs and codeine were given. On the sixth day of injury the distal half of the finger was blue-black, the middle phalanx was pink and the light brown subcutaneous discoloration was still present (fig. 1).

A scanty purulent discharge appeared at the incision on the ninth day. A visiting surgeon, seeing the finger for the first time and noting the distal black discoloration, commented "I fear that amputation will be necessary." Another surgeon saw the finger the next day and said "I hold no hope for the distal phalanx and little for the middle one."

The finger seemed to improve a great deal about the twelfth day after injury. Much of the redness had disappeared and skin was desquamating, leaving viable skin behind. The areas of previous light brown discoloration had taken on a translucent appearance. The distal portion of the terminal phalanx was black and slightly swollen.

The finger continued to improve during the ensuing weeks until only an area 1 centimeter in diameter on the finger tip was lost. The rest of the finger was pink except for the translucent areas. The entire finger was decidedly indurated, but in spite of this there was only moderate limitation of motion.

About six weeks after the injury the finger had regained its entire range of motion and the translucent areas had begun

to break down and discharge a waxy material, leaving small pockets in the skin (fig. 2). X-ray examination revealed some osteoporosis of the phalanges of the injured finger.

The patient is now back at work two months after the injury, with only slight limitation in the usefulness of the finger.

MECHANISM OF INJURY

The mechanism of these injuries is similar in all the cases. A grease gun is used to inject grease under high air pressure (1,000 to 7,000 pounds) through a needle-like injector into an adapter on a car spring or shackle. The operator accidentally touches the end of the injector while the trigger of the gun is tripped. The grease is then injected into the finger or hand in varied quantities. It spreads diffusely throughout the tissue of the finger or hand and may even go up into the wrist, depending on the quantity of the grease and the pressure at which it is injected. It is important to remember that the needle-like injector does not have to pierce the skin. The grease is ejected at such a velocity that it may act as a bullet and penetrate the finger even at a distance of 8 inches, such as occurred in Mason and Queen's second case.

Such an injury may also occur in persons repairing Diesel engines.[4] In such engines fuel oil is ejected into

Fig. 2.—Appearance of finger six weeks after injury, showing the small pits through which some of the grease was extruded.

firing chambers at high pressure through very fine nozzles. If a hand touches these while the compressor is accidentally tripped, the fuel oil will penetrate the hand, causing severe injuries.

PATHOGENESIS AND PATHOLOGY

1. *Acute Phase.*—There are three factors which may devitalize tissue during the acute phase of such an injury: pressure, chemical irritation of the grease and secondary infection.

The original swelling and discomfort are due to the pressure of the injected mass in the closed space of the finger or hand. Such pressure may traumatize the tissue beyond repair or may embarrass the blood supply and lead to gangrene.

If the original pressure is not enough to cause irreparable damage to the involved region, the grease may set up an acute reaction which further destroys the affected area. In Smith's amputated finger [1] multiple subcutaneous abscesses and areas of necrosis were found. Dial [5] injected small quantities of fuel oil subcutaneously in rabbits, and a sterile abscess developed in each instance with local redness and swelling.

The role which secondary infection would play in increasing the damage to such devitalized tissue is readily understandable.

2. *Chronic Phase.*—The tissue of the involved region takes care of the retained grease in various ways. Some of it, as in the case presented, may be extruded to the exterior if it is close to the surface. Most of the grease, however, is encapsulated in chronic inflammatory tissue and either remains permanently in the injured area or is slowly removed by phagocytosis. This chronic inflammation was noted by Smith [1] in the amputated finger as early as the ninth day after the injury, where he found fibroblastic proliferation and giant cell formation. The induration still present in the reported case two months after the injury is probably also due to this.

The encapsulated grease does not remain inert in the tissue but may cause the formation of tumors such as Mason and Queen [3] removed in their cases. The tumor removed in the first case consisted of dense and fibrous tissue with cystic areas filled with greasy fluid which smelled like lubricating oil. Microscopic examination revealed whorls of fibroblasts with foam cells, plasma cells, polymorphonuclear cells and some lymphocytes, monocytes and giant cells. The cystlike spaces were lined with flattened connective tissue cells. The fluid from the cysts, the foam cells and some of the cells lining the cysts stained orange-red with sudan III. A small traumatic inclusion epidermoid cyst was present in the specimen, no doubt caused by direct implantation of epithelial cells at the time of injury. The second tumor consisted of a dense grayish mass resembling scar tissue with cystic areas filled with gray oily fluid. Microscopic examination revealed fibroblastic tissue with lymphocytic infiltration. The cystic spaces were lined with flattened cells somewhat similar to epithelium.

These tumors are similar to the tumors caused by the injection of other oils and greases such as machine oil, linseed oil, sesame oil and paraffin.[6] If such tumors are present in an extremity they may ultimately become so large and ugly as to necessitate amputation of the entire extremity. Such gross deformities have not yet been reported following grease gun injuries, because such injuries are of recent origin and sufficient time has not elapsed to permit the development of these large oleomas. Mason and Queen [3] logically predict that their occurrence is inevitable in the future.

TREATMENT

The best treatment is prophylactic, and efforts should be made to inform mechanics of the dangers inherent in careless handling of the grease guns. This could be done through circulars issued to filling stations and garages by local health departments and also through permanent labels on the guns applied by the manufacturers.

Once the injury has occurred, expectant and conservative treatment in the form of bed rest, sedation and

4. Rees, C. E.: Penetration of Tissue by Fuel Oil Under High Pressure from Diesel Engine, J. A. M. A. **109:** 866-867 (Sept. 11) 1937. Hughes, J. E.: Penetration of Tissue by Diesel Oil Under Pressure, J. A. M. A. **116:** 2848-2849 (June 28) 1941. de Lacerda Filho, N.: Wound of Fingers by Diesel Oil Under Pressure, Bahia med. **12:** 63-66 (April) 1941. Dial.[5]

5. Dial, D. E.: Hand Injuries Due to Injection of Oil at High Pressures, J. A. M. A. **110:** 1747 (May 21) 1938.

6. Hesse, E.: Die chirurgische und gerichtlichmedizinische Bedeutung der künstlich hervorgerufen Erkrankungen, Arch. f. klin. Chir. **136:** 277-291, 1925. Vinogradov, I.: Ueber Spätfolgen künstlicher Oleogranulome, Arch. f. klin. Chir. **187:** 69-78, 1936. Hunt, H. L.: Conclusions from 100 Cases of Paraffinoma, M. Times, New York **52:** 145-148, 1924. Wolf, G. D.: Paraffinoma of the Nose, Am. J. Surg. **55:** 152-155 (Jan.) 1942. Rosser, C., and Wallace, S. A.: Tumor Formation: Pathologic Changes Consequent to Injection of Oils Under Rectal Mucosa, J. A. M. A. **99:** 2167-2170 (Dec. 24) 1932. Jackman, R. J.: Differential Diagnosis, Pathologic Aspects and Treatment of Rectal Tumors of Chemical Origin, Proc. Staff Meet., Mayo Clin. **15:** 188-192 (March 20) 1940. Cruickshank, A. H.: Paraffinoma of the Peritoneum, Lancet **1:** 4-6 (Jan. 4) 1941.

massive dressings at room temperature is all that is available. No hot soaks should be used, since these will increase the tissue demands for blood and in the presence of impaired supply may lead to gangrene.

Liberal longitudinal incisions along the involved finger have been advised to release the grease. Most of the grease, however, is dispersed widely throughout the finger and it is doubtful if it could be removed by such incisions. Since these cases are usually seen only after the acute reaction has occurred, the incisions would probably devitalize the digital tissue further.

Surgery should be limited to the removal of sloughing tissue and/or incision of fluctuant areas when abscesses develop. Early amputation is to be cautioned against, since it is difficult to evaluate the tissue damage beneath the swelling. In Brooke and Rooke's case the finger was indurated and black on the fourth day and yet it was not lost. In the reported case the pessimistic consultations of the visiting surgeons should be compared with the final result, in which only a 1 centimeter area on the tip of the finger was lost.

A general anesthetic should be used if any surgical procedures are undertaken, because procaine digital block has been responsible for so many cases of digital gangrene.[7]

When subcutaneous oleomas develop, Mason and Queen [3] advise their removal so as to prevent the distressing deformities which may develop. The removal should be performed under general anesthesia and in a bloodless field. Careful dissection of the nodules from the underlying structures should be undertaken so as to be sure that they are entirely removed. If overlying skin is involved, it should be sacrificed and the resultant defect repaired with free or pedicle skin grafts.

STRUCTURE AND DEVELOPMENT OF THE SPINE

THEODORE A. WILLIS, M.D.
CLEVELAND

That part of the human body loosely referred to as the back is a complex arrangement of bones, joints, muscles and fasciae morphologically and physiologically the same as like tissues elsewhere in the organism. The bones are arranged in column and with the other tissues are segmentally innervated and nourished. In addition to these common tissues there is, between each two presacral vertebral bodies, a disk of specialized fibrous tissue peculiar to the midline of the body. These are attached to the cartilaginous plates of adjacent vertebral bodies and are pulpified centrally to serve as combination shock absorbers and rocking joints.

In addition to the amphiarthroses or half joints formed by the disks, each vertebra forms true joints with the segments above and below it by paired articular processes, the inferior pair hooking down behind the superior pair of the segment below. These are true diarthroses having capsules, synovial linings and articular cartilages. The articular processes extend upward and downward from short, stout bases or pedicles on either side of the posterior surface of the vertebral body. Here also arise the laminas, which extend backward, downward and medially to unite in the midline and form the spinous processes, completing the bony ring through which the spinal cord passes.

This ring is a protection for the cord and for its nerve roots until they emerge from the intervertebral foramens. At the same time it is a rigid background against which the cord and its roots may be compressed by neoplasms, granulation tissue, abscesses or displaced disks. The bony foramens may be diminished in diameter by hypertrophic changes, loss of intervertebral disks or hyperextension and compress the nerve roots as they emerge from the neural canal.

Extending laterally from the base of either pedicle are the transverse processes. These vary greatly in size and conformation in different sections of the vertebral column. They serve as areas for the attachment of ligaments and muscles.

In addition to the three points of articulation just described, adjacent vertebrae are bound together by strong, inelastic, fibrous ligaments attached to their bodies and processes. These determine the extent to which one vertebra can move in relation to its neighbors. Motion between any two segments is slight and varies in different parts of the column, but the sum total of motion of the column is considerable.

Anteroposterior motion of each vertebra takes place about a transverse axis near the posterior border of its body. Flexion is checked by the supraspinous, interspinous and interlaminar ligaments binding adjacent vertebrae together posteriorly and to less extent by the ligamenta flava, which differ from other ligaments in the possession of elastic fibers. In flexion injuries, except in the cervical area, compression of vertebral bodies occurs rather than rupture of these posterior check ligaments or dislocation of the articular processes.

Extension of the back is restricted by the anterior vertebral ligament and the disks. Hyperextension injuries result in fractures of the pedicles and laminas rather than in disruption of the anterior ligaments and opening of the intervertebral spaces.

At the cephalic end of the column the intervertebral ligaments are represented by the vertebrocranial group; in the thoracic area they are reinforced by the costovertebral ligaments and at the caudal extremity by the powerful lumbosacral, sacroiliac and lumboiliac structures which stabilize the vertebral column on the pelvis. These groups of ligaments with the intertransverse group determine the degree of normal lateral motion and rotation of the column.

Supporting the skeletal structures and controlling motion of the back within the limits determined by the ligaments are the muscles. These are arranged in symmetrically opposing groups. Posteriorly the short and long intervertebral muscles attached to posterior and lateral processes, the vertebral-costal, vertebral-iliac and vertebral-sacral groups produce extension of the back and, with other coordinated groups, rotation and lateral bending. At the cephalic end homologous muscles control motion of the head and neck. Altogether the muscles form a heavy coordinated integrated mass making up the posterior wall of the torso.

Flexion of the back is produced by contraction of the psoas muscles when the thighs are fixed, by the anterior and lateral abdominal muscles acting through the levers of the thoracic cage and pelvis and by the anterior neck muscles. Rotation and lateral bending are accomplished by coordinated acton of all groups.

The tissues of the back are innervated and nourished by the posterior divisions of the segmental nerves and vessels.

Each segment of the back is supplied by both sympathetic and spinal ganglions connected by communicating branches. Impulses arising from stimulation of either

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7. O'Neil, E. E., and Byrne, J. J.: Gangrene of the Finger Following Digital Nerve Block: Report of 8 Cases, Am. J. Surg., to be published.

This paper, in a symposium on "Backache," is published under the auspices of the Section on Orthopedic Surgery.

may produce spasm in the muscles which control the area and give rise to local, radiating or referred pain. If the irritation is severe or long continued, actual neuritis may develop, with resulting paresthesia, muscle atrophy, circulatory change or actual paralysis. Such

Fig. 1.—Lateral views of the spinal column of a new-born infant: *A*, lying at ease with hips flexed at 90 degrees; note that there is a single thoracicolumbar posterior convexity. *B*, with the hips extended to 135 degrees, forming the lumbar forward convexity.

symptoms most commonly involve the distributions of the brachial and sciatic plexuses. Careful analysis will usually lead to the proper diagnosis and localization of the causative factor.

VARIATIONS AND ANOMALIES OF THE BACK

Like all other parts of the body, the spinal column is subject to defects and anomalies of development. The vertebral column was an early invention in zoological evolution, and the suborder of animals characterized by its possession includes such divergent classes as fish, reptiles, birds and mammals. Each class diverging from the parent stem has given origin to many families, genera and species presenting considerable variation in the number of vertebral segments. There is a lesser but frequent variation among individuals of the same species, indicating that the columns are still in a state of flux. Of the columns of the anthropoids, that of man has acquired the greatest degree of numerical stability.

Each human vertebra is formed by the fusion of adjacent halves of two primitive somites and passes through membranous and cartilaginous stages to become bone. At any time during this segmentation and transition there may occur variation in the process, resulting in defective or anomalous development of the segment.

Irregular fusion of the half somites gives rise to hemivertebrae, a not infrequent anomaly. When it occurs there is usually a corresponding anomaly on the opposite side of the column a few segments distally, which corrects the order of fusion. Though the lesion causes deformity of the back, it is apparently of no great clinical importance.

In a clinical study of the human vertebral column,[1] the number of segments of the vestigial coccyx and of that part of the sacrum distal to the articulations with the ilia is of no particular consequence. The number of cervical segments is found to be remarkably constant. The thoracic vertebrae, distinguished by attachment of ribs, vary in number from eleven to thirteen, the modal number being twelve. The number of lumbar segments varies from four to six from a mode of five. There is frequently a gain or loss of one thoracic segment with compensatory loss or gain of a lumbar, the total number of presacral segments remaining unchanged. Such a variation was found in 9 of 748 skeletons that I examined. In 4 of these a lumbar increase compensated for a thoracic decrease. In 5 the variation was reversed. Five of the 748 skeletons had but 23 presacrals, 26 had 25. The remainder, 717, or 95.8 per cent, had the modal number of 24 presacral segments—a considerably greater degree of stability than is found in any of the other anthropoids. Todd[2] found that in the line of evolution leading from the primitive mammal to man there has been a progressive shortening of the presacral column which is parallel to specialization in skull, brain and teeth.

The first sacral segment of the vertebral column is determined by the level at which the ilia articulate with the column to form the sacroiliac joints. These are bastard joints, being formed not by vacuolation in the mesodermal tissues as are most joints but by the approach of the ilia, developing in the limb buds, to conjugate with the vertebrae. The meeting is usually, but not always, bilaterally symmetrical. The point of assignation determines the number of presacral segments. Shortening of the column is accomplished by evolutionary progression of this tryst toward the head. Lagging of one ilium behind the other results in asymmetrical sacralization of the last lumbar or first sacral segment.

The addition or subtraction of a segment cephalad to the sacrum is probably of no clinical significance. In the more strenuous physical fight for existence during

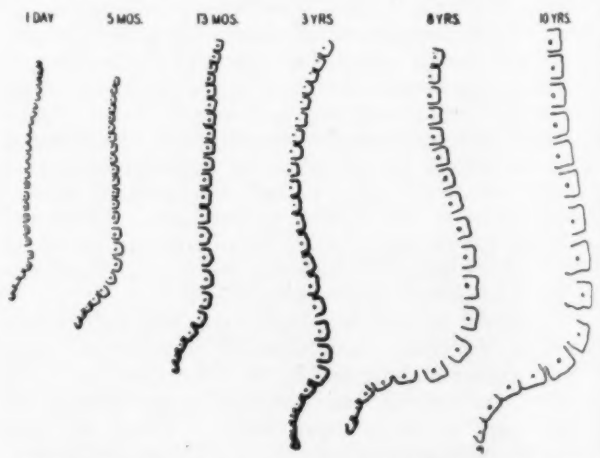

Fig. 2.—Tracings made from lateral roentgenograms of spinal columns at various ages, the subject lying at ease. All reduced on the same scale. The 13 month baby had not yet begun to stand, because of mental deficiency. Figures 1, 2 and 3 are reprinted with the permission of the Journal of Bone and Joint Surgery.

past eras the shorter column must have been of some advantage; otherwise the process would not have gone on. Of much more interest are partial loss or gain of

1. Willis, T. A.: The Lumbosacral Vertebral Column in Man, Its Stability of Form and Function, Am. J. Anat. **32**: 95-123 (July) 1923.
2. Todd, T. W.: Numerical Significance in the Thoracicolumbar Vertebrae of the Mammalia, Anat. Rec. **24**: 261-286 (Dec.) 1922.

a segment, as visualized in unilateral or bilateral sacralization of the last free segment with large transverse processes impinging or articulating with the sacrum or ilium, narrowing of the lumbosacral disk or formation of a false promontory.

Other anomalies of development prone to occur at the lumbosacral area are defects in closure of the neural canal and in development of the articular processes which anchor the lumbar column to the sacrum. The latter may lie in any position between the sagittal plane characteristic of the lumbar vertebrae and the transverse plane of the sacral, and frequently vary bilaterally, definitely affecting stability of the lumbosacral anchorage.

THE UPRIGHT POSTURE

In those early vertebrates that left the water to become amphibious and terrestrial in habit, developing legs from fins, the vertebral column lost its flexible cylindric form and acquired a slight posterior arch between its areas of support with reverse curves of its tapering extremities. Quadripedal locomotion required stronger bone formation at the weight bearing regions and larger bone surfaces for attachment of the ligaments and muscles that supported the arch and managed locomotion.

When man assumed the upright posture, further changes in structure were necessary. The 90 degree vertical turn accomplished at the lumbosacral area subjected this part to enormous mechanical strain. It was managed partly by rotation backward of the acetabulums on the femoral heads and partly by hyperextension of the lower lumbar and lumbosacral joints.

The development of the upright posture is reviewed in the embryology of the human infant. At 3 months the fetal column presents a single posterior curve. It then develops a lumbosacral angulation. At birth there is a posterior thoracicolumbar convexity and a sacral curve has appeared; the head, hips and knees are flexed. When the face is tipped up the cervical curve develops, convexity forward. When the infant's hips are extended, the lumbar vertebrae are pulled forward by the psoas muscles and the hip ligaments, forming the typical lumbar curve (fig. 1). This does not become firmly impressed on the skeleton, however, until the child has been walking for several years (fig. 2). The more the hip joints can be extended, the less lumbar hyperextension is necessary and the more directly over the femoral heads the body weight is borne. Lack of hip extension accentuates the lumbar curve, increasing greatly the shearing force and strain on the lumbosacral ligaments, muscles and articular processes.

There has been described as existing in the skeletons of various races of men a defect or anomaly of development of the neural arch of a lumbar vertebra which affects the stability of the spinal column at the involved level. Since it has not been found in a fetus or in any of the anthropoids, it apparently is due to assumption of the upright posture or to some human custom in the care of infants. The etiology is still under dispute.

The defect, which consists of an interruption of bone continuity, occurs between the inferior and superior processes on either one or both sides of the neural arch, so that anchorage of the superimposed column to the segment next below depends on fibrous tissue connection between the laminar fragments (fig. 3 *A, B, C* and *D*). It most often involves the last lumbar segment but has been found in the other lumbars. It predisposes the individual to forward displacement of the involved vertebra on the segment below, spondylolisthesis.

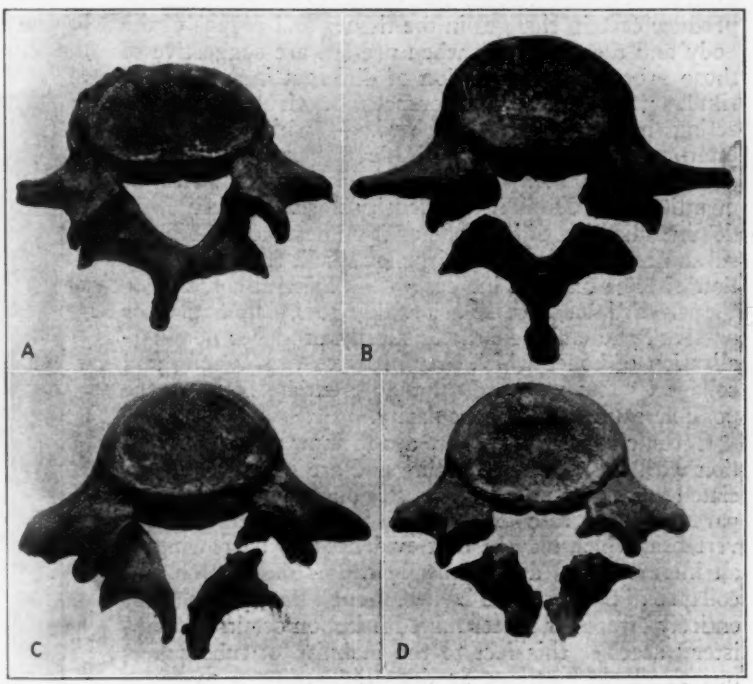

Fig. 3.—*A*, a last lumbar vertebra showing a unilateral defect of its lamina; note the arterial foramen piercing the defect; such a unilateral defect is of no clinical significance, as the opposite lamina is intact. *B*, bilateral laminar defect; in such an instance the anchorage of the spinal column to the sacrum depends on the fibrous tissue connecting the separate arch to the pedicles; stability of the lumbosacral articulation is definitely affected. *C*, association of the unilateral laminar defect with spina bifida leads to instability, though either defect alone may not. *D*, bilateral laminar defects associated with spina bifida; the cadavar from which this specimen was obtained showed a pronounced degree of spondylolisthesis; defects of this type and of type *B* are responsible for such a displacement in the great majority of instances.

From sources in Russia, Africa, Europe and Japan and in aboriginal and modern America the neural arch defect has been reported in from 5 to 7 per cent of human skeletons. Stewart [3] found it in 20 per cent of Eskimo skeletons from north of the Yukon. These Eskimo skeletons also showed a greater degree of numerical vertebral variation than has been found in other human material, 14 per cent, and always toward a longer column. In my studies [4] the defective neural arch has been found in a higher percentage of those columns which showed an increased number of presacral segments.

The various tissues of the back are subject to all the diseases and injuries that may affect similar tissues elsewhere in the body and react to them in a similar manner.

X-RAY INTERPRETATION

The value of the x-rays as an instrument of diagnosis lies in their power to penetrate substances impervious to ordinary light and register the result on a fluoroscopic screen or a photosensitive film. Since the different tissues of the body vary in their resistance to the rays, the denser structures and, by filling them with opaque

3. Stewart, T. D.: Incidence of Separate Neural Arch in the Lumbar Vertebrae of Eskimos, Am. J. Phys. Anthropol. **16**: 5-62 (July-Sept.) 1931.

4. Willis, T. A.: The Separate Neural Arch, J. Bone & Joint Surg. **13**: 709-721 (Oct.) 1931.

material, the hollow organs can be visualized and their positions, size, structure and form determined.

Intelligent interpretation of the shadows cast on the screen or film requires expert knowledge of their normals and of the changes caused in them by disease and injury. Though certain pathologic processes typically produce certain changes in the tissues and organs of the body and these changes when present are suggestive of those processes, the reaction of different individuals to similar irritants, and differences in virulence of the acting irritants, introduce variants which make the interpretative diagnosis probable rather than positive.

Changes in bone density are either qualitative or quantitative. Diminished density results either from demineralization of the bone or from destruction of bone substance. Increased density may result from proliferation of bone or from increase of its mineral content.

Increased local vascularity, due to inflammation or passive hyperemia, characteristically produces demineralization of bones which may progress to softening and collapse. The x-rays do not differentiate between the possible causes of the vascularity.

Chronic inflammations are apt to show actual destruction with less demineralization and are frequently associated with bone proliferation. Reduced vascularity of a part results in calcification of tissue. Tuberculosis of a vertebra, which may be first evidenced by narrowing of an intervertebral disk, typically causes destruction and collapse of the vertebral bodies, though the disk does not entirely disappear unless mixed infection occurs. Phemister [5] ascribes this fact to the inability of tuberculous pus to digest cartilage as does the ordinary pyogenic

Fig. 4.—Fractures with but slight deformity of the right transverse processes of the 1st, 2d and 3d lumbar vertebrae.

process. Tuberculosis is typically destructive, but since Percival Pott's original description of its vertebral lesions it is known that the disease sometimes involves the vertebrae superficially, stripping the periosteum from the posterior and lateral processes as well as from the bodies and causing calcification of the intervertebral ligaments, with or without narrowing of the disks, which it bridges.

Vertebral bodies and the denser bony processes may be the sites of primary neoplasms and are frequently the sites of metastatic lesions. The more common

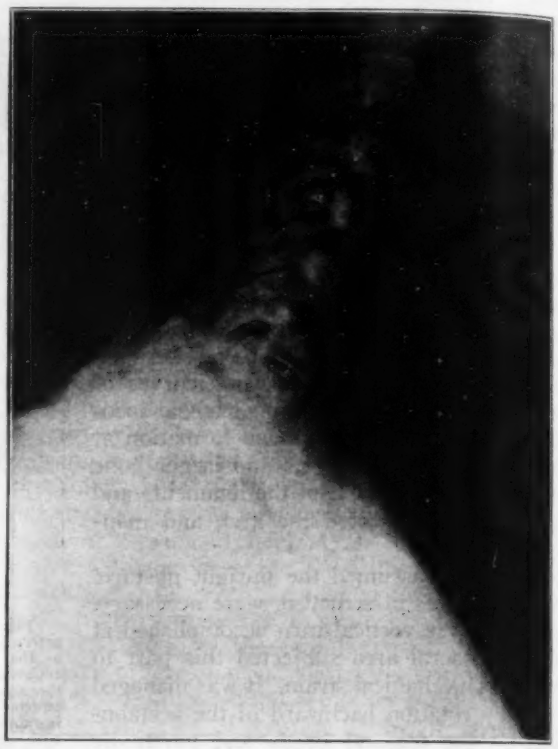

Fig. 5.—Fractures of the laminas of the 6th cervical vertebra with forward displacement of this segment on the seventh. The cord was not seriously injured in this instance. Note the final stabilization by calcification and ankylosis of the vertebral bodies.

of the vertebral tumors are metastatic carcinoma, myeloma, lymphoblastoma and polycystic disease. Positive differentation of these by x-ray examination is frequently not possible.

Any part of any vertebra may be fractured. Those fractures most frequently incurred are compression fractures of the lower thoracic and upper lumbar vertebrae, fractures of the transverse processes of the midlumbar area (fig. 4), the spinous processes of the cervicothoracic and fracture of the cervical laminas, with or without dislocation of the articular processes and bodies (fig. 5).

Dislocations of vertebrae without associated fracture are rare and involve particularly the cervical segments.

Fractures and dislocations of the vertebral column can be tentatively diagnosed from clinical symptoms, but careful x-ray study is necessary to identify them positively. A detailed consideration of these, as of diseases of the back, from a roentgenologic point of view, is by far too large a subject for the present discussion.

Routine x-ray study of the back includes anteroposterior stereoscopic and lateral views of that part to which the symptoms are referred. These views may show conditions suggesting study of other parts of the back or other views of the same part. The normal curves of the column cause an overlapping of vertebral body shadows in the anteroposterior view, except of those bodies the surfaces of which are parallel to the

5. Phemister, D. B.: Changes in the Articular Surfaces in Tuberculous and in Pyogenic Infections of Joints, Am. J. Roentgenol. **12**: 1-14 (July) 1924.

rays. To obtain a true view of a particular vertebra, this must be borne in mind and the rays properly directed. Since the articular processes of the lumbar vertebrae vary between the sagittal and transverse positions, oblique views from either side are often needed to show them clearly.

As noted in discussion of its anatomy, the spinal column is held upright on its base by opposing groups of muscles. When the balance of these groups is disturbed either by spasticity or by paralysis, the column is deformed, curving toward the spastic group or away from the paralytic. The center of weight is thus thrown off balance, and toppling of the structure must be prevented by development of compensatory curves in the opposite direction. The primary curve gradually becomes fixed. This is a differentiating sign between primary and secondary deformities and can be demonstrated in x-ray films of the column taken with the subject standing and bending to alternate sides. The degree of a fixed curvature can be determined mathematically by measuring on the x-ray film the angle of intersection of perpendicular lines drawn from the centers of the transverse diameters of those two vertebrae which mark the ends of the deformity.

Anteroposterior deformities of the spinal column are simple curves. Lateral deformities are accompanied by rotation of the involved vertebrae about their vertical axes. Such rotation is necessary, first, because the column is a curved column and as such cannot bend laterally without rotation of its component parts and, second, because each vertebra has tripodal articulations with its neighbors.

The various vertebral anomalies mentioned in discussing anatomy of the back are demonstrable by x-ray examination, but the presence of any one of them does not necessarily solve the problem of a person's backache (fig. 6 *A, B* and *C*). They are of clinical importance only as they affect the mechanical stability of the back or predispose the nerves and ligaments to injury. Some of them, particularly defects in the articular processes and in the laminas, are shown most clearly in oblique views of the spinal column.

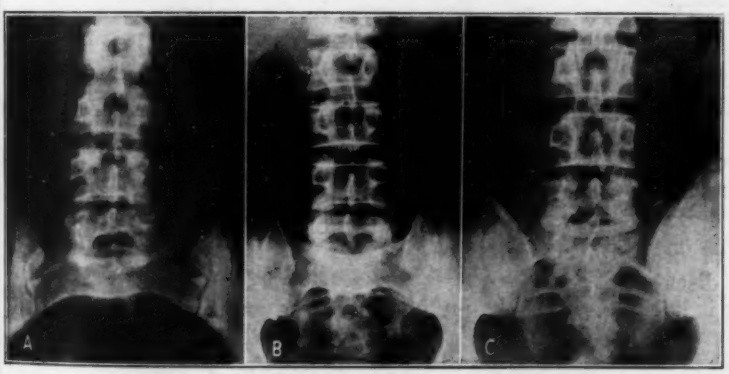

Fig. 6.—*A*, anomalous transverse processes of the last lumbar vertebra. Unless painful bursae form between these and the sacral lateral processes or the ilia, or they irritate a nerve root because of lordosis, they are of little clinical importance. *B*, defective and asymmetrical development of the lumbosacral articular processes; note increased density of bone, suggesting long continued mechanical irritation; such processes predispose to mechanical strains and sprains. *C*, anomalous development of the inferior articular processes of the 3d lumbar vertebra, more pronounced on the right; these are probably of little clinical significance, as there is still efficient anchorage left.

The bilaterally defective neural arch definitely affects the stability of the spinal column at the level of its incidence. When the fibrous tissue binding the inferior articular processes and laminas to the pedicles is stretched or ruptured, the superimposed column glides forward on the segment below. This is the mechanism of spondylolisthesis in most instances (fig. 7 *A* and *B*).

A reverse spondylolisthesis, or backward displacement of the last lumbar on the sacrum, has been described by several authors. After careful analysis of their descriptions and illustrations, I am of the opinion that this diagnosis is based on faulty interpretation of the roentgenograms and is really an optical illusion due to the difference in anteroposterior depth of the last lumbar and first sacral vertebral bodies.[6]

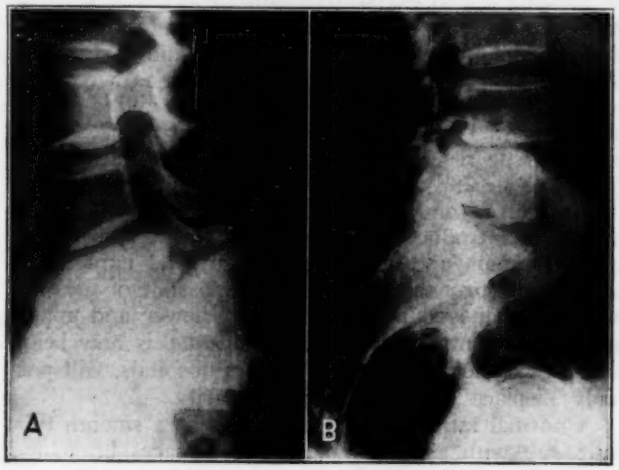

Fig. 7.—*A*, lateral view of lumbosacral area, showing defective neural arch of the last lumbar segment with forward displacement of that segment on the sacrum, the usual type of spondylolisthesis; this patient complained of recurring low bachache with pain along the sciatic distribution, which was aggravated by coughing. *B*, lateral view of a lumbar spine; note the defect of the laminas and forward displacement of the 4th lumbar on the 5th; there is narrowing of the intervertebral space and depression into the inferior surface of the body of the 4th segment suggesting displacement of the disk. This patient was an overweight elderly man who had had no symptoms of back trouble preceding a fall onto his buttocks. There was sciatic pain on the left side and definite muscle weakness. This may have been an actual fracture. The patient died of cardiovascular disease and no autopsy was permitted.

In studying several hundred macerated skeletons, I [7] found that beginning at about the 35th year of age there is a progressive lipping and calcification at the peripheries of the vertebral bodies and of the joints at the attachments of the synovial membrane and ligaments. This is most pronounced in thick boned heavy skeletons and least so in the long slender type. It appears first and to the greatest degree in the sacroiliac and lower lumbar areas. In the former it ultimately results in calcification of the anterior sacroiliac ligament, which usually starts at the pelvic brim and extends toward the upper and lower poles of the joint, often resulting in complete bridging and bony ankylosis of the joint (fig. 8 *A* and *B*). Because this bridge is thin and has a background of thick dense bone, it often is not shown on x-ray films. Its presence is suggested by a hazy appearance, with indistinctness of the joint outline. In the lumbar and lumbosacral areas the hypertrophic process involves particularly the vertebral bodies and often progresses to ankylosis of adjacent segments. It also involves the articular processes but is more difficult to show here by the x-rays.

Instability of a sacroiliac joint may be demonstrated roentgenologically by a change in level of the pubic bones in a standing patient when weight is borne on

6. Willis, T. A.: Backward Displacement of the Fifth Lumbar Vertebra: An Optical Illusion, J. Bone & Joint Surg. **17**: 347-352 (April) 1935.

7. Willis T. A.: Sacroiliac Arthritis, Surg., Gynec. & Obst. **57**: 147-155 (Aug.) 1933.

alternate feet. Actual dislocation of a sacroiliac joint probably does not occur without associated fracture of the pelvis. Standing films are useful also in showing restriction of mobility between adjacent vertebrae as the trunk is flexed to alternate sides.

X-ray study of the hollow organs of the body by introduction of opaque material has been applied to the intradural space as an aid in diagnosis and localization of intradural and extradural pathologic changes. The currently most popular mediums injected to outline the dural space are radiotransparent air and radiopaque iodized oil. The former is less efficient as a contrast medium but is less irritating to the tissues and is readily absorbable. The latter is reported to have caused occasional tissue reactions and remains in the dural space indefinitely. It is, however, much more distinctly outlined than is air. Opinion is quite general that it should be introduced only when diagnostic and localizing symptoms are indefinite and surgical exploration seems quite probable. As much as possible of the substance is removed at operation. A newer and apparently safer contrast medium, pantopaque, is now being used and, when available to civilian hospitals, will possibly displace the others in popularity.

A normal intradural space appears as a smooth tube by x-ray with a pair of nerve root spaces branching

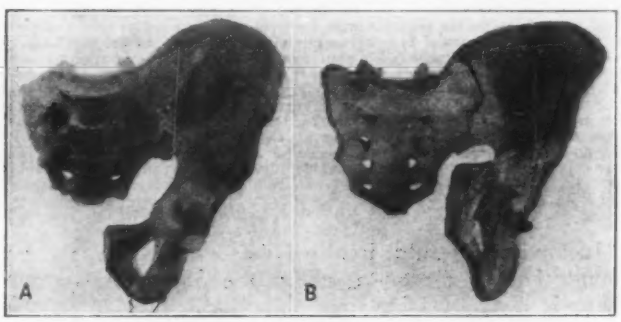

Fig. 8.—*A*, complete calcification of the anterior sacroiliac ligament as shown by a photograph; only that part of the joint above the pelvic brim is affected. *B*, calcification of the anterior sacroiliac ligament at the pelvic brim. There is also moderate arthritic lipping about the joint surfaces elsewhere. Note that the joint space is not narrowed. Such calcification gives very little evidence of its presence by x-ray. Reprinted by permission of Surgery, Gynecology and Obstetrics.

downward and outward at each segment. The medium flows freely along the cord as the table is tilted toward the head or foot. Any blocking of this flow or indentation of the column of medium is pathologic. The x-rays, however, do not determine the nature of the indenting substance.

SUMMARY

Man's back is a complicated arrangement of ordinary tissues subject to the same injuries and diseases as are similar tissues elsewhere in the body. It is liable to defects and anomalies of growth and development as are all parts of the animal body. Because there is still going on at the lumbosacral junction an evolutionary shortening of the vertebral column, and because this same part has been particularly involved in the transition from the pronigrade to the upright posture, this area is particularly apt to develop symptoms of strain, sprain and nerve root irritation of mechanical origin.

The x-rays are of primary importance in diagnostic study of the back. They give valuable information concerning the structure, density and position of the bones and joints and, with special technics, of some of the soft tissues as well. Their use is mandatory when diagnosis by clinical examination is at all doubtful.

10515 Carnegie Avenue.

BACKACHE

EXAMINATION AND DIFFERENTIAL DIAGNOSIS

RALPH K. GHORMLEY, M.D.
ROCHESTER, MINN.

When one reviews the progress in the understanding of this problem one must realize that real advances have been made in the past twenty years. Better methods of diagnosis have been developed and an ever increasing knowledge of many of the underlying causes has helped to develop an understanding of this condition. The problem still remains a broad one, with many phases yet to be understood.

In making a diagnosis, I have found it convenient to divide backache into the following groups:

1. In most cases of acute backache an accurate diagnosis cannot and should not be attempted on the first examination. Usually the picture is so masked by pain and muscle spasm that a satisfactory examination cannot be made. Often, with two or three days of rest, the clinical picture will so change that the diagnosis will be entirely different from the one that was considered likely at first glance.

2. A fairly large group of patients seek professional advice because of fear that their backache may be due to some serious involvement of the spinal column or kidneys or other parts. A careful examination will do much to relieve the minds of such patients.

3. In a large group of cases of backache a definite explanation can be found in some organic lesion. This is the largest group and presents many interesting problems in differential diagnosis.

4. One must regard compensation backaches as a different group because in many instances the patient attempts to capitalize on his disability, often to the detriment of his normal recovery. Malingerers and patients who have compensation neurosis can be detected at once by the experienced examiner, and in many instances treatment will prove futile until compensation is settled and that obstacle to recovery removed. Fortunately, in the majority of cases compensation backache runs a more or less normal course and can be treated by routine methods.

5. The final group includes hopeless backache due to malignant disease and other conditions for which nothing curative can be done. Recognition of such a situation is important. Relatives should be informed of the situation, and the patient should be made as comfortable as possible by whatever forms of palliative treatment are available.

HISTORY

The relative importance of an accurate and complete history and a careful and thorough physical examination can be discussed at length. Probably there is no choice between these so far as importance is concerned. Each must be thorough and accurate as to detail. In recording the history, type of pain, onset and duration of the pain, the localization and distribution or reference of the pain and many other features must be noted.

In general there are four types of pain which may be noted in these cases. First, there is static pain or pain that is relieved by rest and brought on by activity. Conditions which produce pain of this sort are usually mechanical faults such as spondylolisthesis and trau-

From the Section on Orthopedic Surgery, Mayo Clinic.
This paper, in a symposium on "Backache," is published under the auspices of the Section on Orthopedic Surgery.

matic spondylitis. Second, there is morning pain, or pain which occurs after resting. Such pain is usually found in inflammatory types of lesions, such as spondylitis deformans and myositis. Third, there is nocturnal pain, or radicular pain. Such pain is often seen in neurologic conditions such as tumors of the spinal cord and lesions of the intervertebral disks. Fourth, there is constant or intractable pain. Usually this type of pain is seen in malignant disease, either primary or metastatic, in some cases of tumor of the spinal cord or in some cases of infection of the intervertebral disks. A partial list of these types of pain and their underlying cause is presented in table 1.

It is always helpful in cases of chronic back pain to determine what types of previous treatment the patient has been given and to note the response which the patient made to such treatment. Such information would naturally lead one to a more definite decision as to a program of treatment to be followed.

Movements of Vertebral Column: These should first be tested while the patient is standing. One should note whether there is any limitation of motion on forward bending. If localized limitation of motion is present this should be noted. Backward bending is usually only through a small range and usually of less significance than changes in forward bending. Side bending with the arms held to the side and shoulders slumped forward is difficult to evaluate. This can be obviated by asking the patient to place his hands behind his head and his arms in the plane of the body. Such a position lifts the scapulas and gives a better view of the spine. Limitation of bending should be noted as well as the direction of such limitation. If the limitation is very noticeable, it is well to measure and record the amount of expansion of the thorax between expiration and inspiration at this time.

Palpation and Percussion: Tender points should be carefully noted. In palpating or percussing the spinal

TABLE 1.—*Particular Types of Pain Associated with Backache*

	Type of Pain Present			
	Static, Relieved by Rest	Morning, With or Without "Jelling"	Nocturnal	Constant
Probable pathologic condition present	Traumatic spondylitis Spondylolisthesis Spondylolysis Old fractures of vertebrae Fractures of facets and pedicles Perivertebral traumatic changes	Usually inflammatory lesions Myositis Spondylitis deformans Fibrositis Traumatic injuries with superimposed inflammation	Associated with neurologic conditions Tumors of the spinal cord Lesions of disks Obscure types, no demonstrable lesion May be forerunner of spondylitis	Malignant lesions, primary or secondary Other tumors of spinal cord Some lesions of disks Acute infection, such as osteomyelitis or infection of intervertebral disk

TABLE 2.—*Lesions Which Often Underlie Pain in Lower Part of the Back*

	General Type of Lesion Present					
	Postural Strain	Static or Post-Traumatic	Rheumatic	Infectious (Other Types)	Senescent	Neoplastic
Probable pathologic condition present	Abnormal lordosis Adolescent; other types of round back Obesity Faulty body and foot mechanics	Spondylolisthesis Defective pedicles Old fractures (Kümmell's) Fractured facets Fractured pedicles Thin disks; protruded disks Hypertrophic and post-traumatic changes Congenital anomalies	Infectious arthritis Spondylitis deformans Myositis	Tuberculosis—benign osteitis—osteitis deformans Intervertebral disks, inflammatory Brucella abortus Typhoid spine	Senile osteoporosis Senescent and hypertrophic arthritis	A. Malignant myeloma Metastatic malignant lesion Primary sarcoma Ewing's tumor B. Benign osteoma and osteochondroma Giant cell tumor Hemangioma

EXAMINATION

A thorough physical examination should be made in every case of backache. Examination of the patient with his clothes on is almost useless. The patient should be stripped and covered with a cape or sheet.

Inspection.—Posture: In inspecting the posture of the patient, one should note the following: (1) round shoulders, especially winged scapula or rounding of the thoracic segment of the vertebral column, (2) lordosis, whether normal, obliterated or exaggerated, (3) abdomen, whether prominent, pendulous or flat, (4) knock knees or bow legs, and (5) whether the feet are pronated or well supported.

Deformities: Any visible deformity or abnormality should be noted. This usually will require only a few seconds. Although many deformities or abnormalities may be observed in cases of backache, only the following will be mentioned: (1) kyphos, (2) scoliosis, whether postural, structural or sciatic, and its direction, (3) pelvic tilting, (4) obvious muscle spasm, (5) shortening of the trunk, which is frequently observed in cases of spondylolisthesis, (6) draining sinuses, (7) tumor masses and (8) prominence of muscle groups caused by spasm.

column, tenderness due to deep seated vertebral lesions usually can be detected only by percussion over the spinous process of that vertebra with the closed fist. Firm percussion in this manner will show the site of a deep lying lesion. A localized area of superficial tenderness should be noted, such as tenderness at ligamentous and muscular attachments, over the spinous processes of the vertebrae and over the posterior superior spine of the ilium. A fairly common site of tenderness is the area over the sacrosciatic notch. At this point one may often say that such tenderness may be due to sacroiliac strain or disease. Such a tender area may often be seen with herniation of a nucleus pulposus at the lumbosacral area and with other types of lumbosacral lesions; therefore too much significance should not be attached to this particular area of tenderness. Palpation of the muscles of the back may reveal three significant findings. First, there may be tenderness. When this is widespread it usually indicates a myositis or fibrositis or some type of generalized muscular lesion. When localized it points toward a localized muscular lesion, such as may be caused by acute strains. Second, spasm of the muscles of the back is readily detected. This is often of a protective nature and may

be unilateral or bilateral, depending on the type of underlying lesion. Third, there may be muscle atrophy or wasting. Flabbiness and atrophy are often seen in cases of long standing backache of various types. Their significance is often overlooked, for, as is the case of disturbances of the knee joint, in which muscle atrophy is often the cause of persistent symptoms, the flabby atrophied muscles of the back may retard recovery from symptoms until their integrity and tone are restored by persistent and faithful attention to exercises designed to restore muscle strength.

Special Tests.—Various types of special tests aid in the diagnosis of painful conditions of the back. One of these is the straight leg raising test, or Lasègue's sign. When this test is positive it is indicative of spasm of the hamstring muscles, which most frequently occurs in association with sciatic pain that is caused by a lumbosacral lesion. Gaenslen's sign is the production of pain over an affected sacroiliac joint by forcible extension of one hip over the edge of the examining table while the opposite hip is flexed. Other signs or tests that have been used in the diagnosis of lesions that may cause backache are Goldthwait's sign, Ely's sign and Patrick's test. Most of these have been used in the differential diagnosis of sacroiliac and lumbosacral lesions. As the widespread interest in lesions of the intervertebral disks has drawn increased attention to the lumbosacral joint, the importance of the sacroiliac joint as a source of symptoms has waned, perhaps to a point where sacroiliac conditions may be overlooked. One of the most recent of the signs to be employed is Ober's sign, which demonstrates a tight iliotibial band. In my experience it has been present at times, but not at other times, and it seems that, as time goes on, its significance has been overemphasized. At times it is of great significance, but when it is not consistently found it may not mean very much.

There is no need to emphasize the importance of good roentgenograms in studying lesions which may cause backache. The making of roentgenograms requires care and skill, and proper preparation of the patient also is important. Anteroposterior and lateral roentgenograms are essential, and in some instances these should be supplemented by stereoscopic anteroposterior roentgenograms. In cases in which lesions of the facets or pedicles are suspected, oblique roentgenograms may be helpful.

Other laboratory tests may be necessary but often are not necessary unless some indication arises. As a routine it is well to examine the urine, determine the concentration of hemoglobin in the blood and perform a flocculation test. In cases in which inflammatory lesions are suspected, one can obtain some help from an estination of the sedimentation rate of the erythrocytes.

SPECIAL TYPES OF LESIONS

There is a rather large group of lesions which may be definitely diagnosed and may be regarded as the cause of pain in the lower part of the back. It is on this group that our interest is particularly centered. A correct diagnosis will end the search for an etiologic factor and one can recommend treatment and offer a prognosis, both of which are difficult in cases in which no lesion can be discovered.

Table 2 lists some of the more frequently found lesions which can cause backache and which can be properly diagnosed and treated. All of these lesions cannot be considered in detail, but a few will be briefly considered because of their importance.

Postural Strain.—Various types of postural strain may be noted. The important thing in connection with this type of backache is to obtain the patient's thorough understanding and cooperation in treatment. Much time and particular effort on the part of the patient are necessary to overcome such defects, and good results can be obtained only if the patient is willing to follow out a program of graduated exercises for a long time in order to regain lost muscular tone and correct carriage.

Round Back and Epiphysitis.—Adolescent round back or vertebral epiphysitis is usually seen among adolescents. The importance of this condition as a precursor of a chronic type of lame back should be realized and every effort made during the active acute stage to prevent the stiffening and deformity that result when treatment is not employed. Treatment consists mainly in a rigid program of exercises to strengthen the erector spinae muscles and the wearing of a brace sufficiently rigid to prevent the severe type of round back deformity. Such a brace must include shoulder straps to keep the spinal column as straight as possible. General hygienic measures also should be stressed. Foci of infection should be eradicated and the diet should be adequate. Under such a program the ultimate deformity in many of these cases will be minimized and much trouble later on in life will be avoided. One sees a good many adults who have backache that is due to increased lordosis secondary to a fixed rounding of the thoracic segment of the vertebral column, obviously resulting from an adolescent kyphosis.

Spondylolisthesis and Spondylolysis.—Spondylolisthesis (figs. 1 and 2) and spondylolysis are equally important as causative factors of backache, with or without sciatic pain. Spondylolisthesis is a well known lesion. Spondylolysis is a term applied to spines with a defect in the pedicle of a vertebra without any forward slipping of the vertebra. This defect also has been called prespondylolisthesis. Both of these conditions, when present, usually are the cause of pain in the back. Their cause is uncertain. In some cases the defect is definitely congenital; in other cases it may be due to

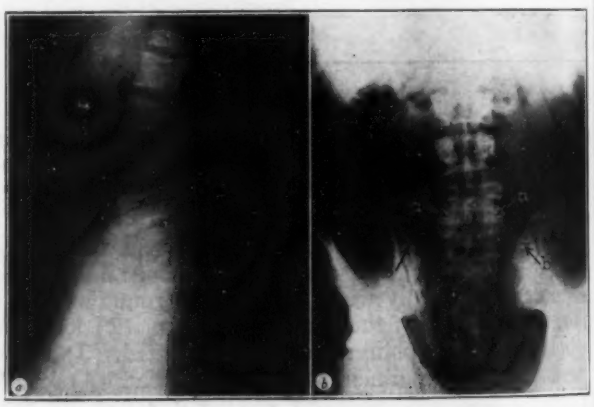

Fig. 1.—Spondylolisthesis: *a*, lateral view showing forward displacement of fourth lumbar vertebra onto the fifth lumbar vertebra; the break in the arch (pars interarticularis) is indicated by the arrow; *b*, anteroposterior view showing incomplete sacralization of fifth lumbar vertebra (indicated by arrow).

injuries at birth [1] or may appear subsequent to trauma. In a few cases it produces symptoms before adult life is reached. It seldom is discovered in childhood; although it may be discovered in adolescence, in most cases it first is recognized in adult life. In many cases

1. Hitchcock, H. H.: Spondylolisthesis: Observations on Its Development, Progression and Genesis, J. Bone & Joint Surg. **22**: 1-16 (Jan.) 1940.

the first symptoms occur after trauma. When the patients are less than 50 or 60 years of age, the best treatment is a fusion operation.

Lesions of Intervertebral Disks.—Lesions of the intervertebral disks may be the cause of symptoms, particularly if the disks have become thinned and undergo hypertrophic changes about their margins. Such changes unquestionably occur as an end result of an

Fig. 2.—Spondylolisthesis and sacralization of right transverse process of fifth lumbar vertebra: *a*, anteroposterior view; arrow *a* points to defect in the pedicle, and arrow *b* points to incomplete sacralization on the right side; *b*, oblique view showing defect (indicated by arrow); *c*, lateral view; defect is indicated by arrow *a*; arrow *b* indicates thinning of the disk at the fifth lumbar interspace, which is not due to trauma but is part of the anomaly producing the sacralization.

ancient herniation of the nucleus pulposus or fibrosis due to wear and tear on a disk. These traumatic changes must be distinguished from congenitally thinned disks, which often are associated with partial or complete sacralization of the fifth lumbar vertebra or a lumbarization of the first sacral vertebra.

In cases in which thinned disks produce persistent pain that is static in type, relief usually can be obtained by a fusion of the two adjacent vertebrae or by lumbosacral fusion in cases in which the fifth lumbar disk is involved. If there is any suspicion of a herniation of the nucleus pulposus, laminectomy should be done at the same time.

Other traumatic changes such as old fractures with localized perispondylitis, some congenital anomalies and fractures of the facets and pedicles also can produce a static type of backache.

Spondylitis Deformans.—Of the rheumatic types of lesions, one must mention particularly spondylitis deformans. This condition, once well established, offers very little difficulty in diagnosis. The typical poker spine with calcification of the ligaments and a rounded kyphotic deformity is not difficult to diagnose. However, in cases of early spondylitis deformans the diagnosis is difficult. The usual picture of a stiff vertebral column, limited expansion of the thorax, roentgenologic changes in the sacroiliac region and elevation of the sedimentation rate may not be present. Usually one or two of this group of signs may be found, but at times none of them may be present. I have seen a good many cases in which a mistaken diagnosis has been made and the true condition not recognized in the early stages. The best advice one can give in cases in which early spondylitis deformans is suspected is to follow a program of treatment suitable for spondylitis deformans and observe the progress.

Myositis and Fibrositis.—Myositis or fibrositis is a rather common cause of backache of the rheumatic type. Pain and stiffness, particularly if it occurs after sitting or arising in the morning, that is relieved to a large extent by activity and is not associated with evidence of skeletal change is often of the myositic or fibrositic type. This condition often is stubbornly resistant to treatment but may be relieved in some instances by heat and deep massage and in others by roentgen therapy. The very stubbornness of this condition in its response to various types of treatment is often helpful in making the diagnosis.

Other Infectious Lesions.—Other types of infectious lesions of vertebrae which must be mentioned are tuberculosis (fig. 3), benign osteitis, infection of an intervertebral disk, such as suppurative infection, and brucellosis and typhoid spine. Tuberculosis is undoubtedly much less frequently seen than in years past. At the same time it now is much more difficult to make a correct diagnosis of tuberculosis of the spinal column than it was in former years. Well advanced tuberculous infection with kyphos and abscess, which frequently was the presenting picture several years ago, should not be allowed to develop. Now the diagnosis should be made before kyphosis has developed. One may have little more to go on than a moderately painful vertebral column with some localizing tenderness on percussion and roentgenographic evidence of thinning of an intervertebral disk and perhaps a slight shadow of the perivertebral soft parts, suggesting an abscess. Evidence of tuberculosis elsewhere in the body may support such a diagnosis. At times one cannot be sure, and only by observation for a period of months can one be certain of the diagnosis. During such a period of observation one should treat the patient for tuberculosis of the spinal column. I believe that it may be wise in many of these cases of suspected early tuberculosis to proceed at once with a bone graft operation. Many months of invalidism and at times progression of an early tuberculous lesion may be arrested by such procedure.

Senile Osteoporosis.—This condition has come to be recognized more and more frequently since it has been established a clinical entity. It usually affects women of middle or advanced age. It is characterized by sharp

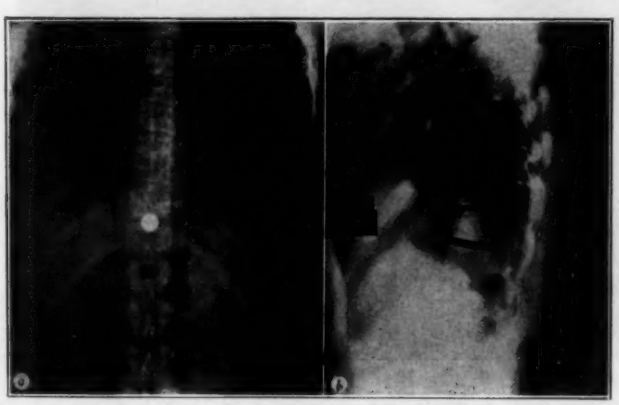

Fig. 3.—Early tuberculosis of the eleventh and twelfth thoracic vertebrae; *a*, anteroposterior view showing fusiform shadow produced by a perivertebral abscess; *b*, lateral view showing thinning of the intervertebral disk (indicated by arrow).

pain in the thoracic or lumbar segment of the spinal column, by a gradually increasing rounded thoracic kyphos and usually by loss of stature. Roentgenograms show extensive osteoporosis involving the vertebrae and compression fractures and ballooning of intervertebral disks. The differential diagnosis usually involves exclusion of parathyroid osteosis, osteitis deformans and

malignant lesions, particularly metastatic lesions. In senile osteoporosis, calcium, phosphorus and phosphatase values in the serum are normal. This is not true in cases of hyperparathyroidism or osteitis deformans. Metastatic malignant lesions are more localized than are lesions of senile osteoporosis, and a primary tumor may be discovered. Myeloma may at times be confused with senile osteoporosis, and only after a period of observation will the differential points be obvious.

Senescent and Hypertrophic Changes.—Senescent and hypertrophic changes about vertebrae are often the cause of backache. Such backache usually follows an injury. The diagnosis is usually easily made on the basis of activation of symptoms by strain or injury and by more or less extensive hypertrophic changes seen in the roentgenogram.

Neoplasms.—Of the various types of neoplasm involving the vertebrae, the most common are metastatic lesions. The most frequent sites of primary lesions are the breast in women and the prostate gland in men. It must be remembered that other types of malignant lesions may metastasize to the spinal column. Every possible site of malignant lesion should be reviewed if a metastatic lesion is suspected. The most important clinical observation to remember in dealing with metastatic malignant lesions is that the resulting pain often is intractable and relieved only by large doses of sedatives. It is a good rule to regard vertebral pain which cannot be relieved by rest, heat, massage and mild sedation as probably due to a metastatic malignant lesion, although this is not always true.

Multiple myeloma is more often present primarily in the vertebrae than anywhere else in the skeleton. Early in the course of this disease the diagnosis may be difficult. In a case in which the disease is well advanced with numerous small "punched out" regions, involvement of bones is easily recognized but an early lesion may be difficult to recognize. The presence of Bence Jones protein in the urine may be suggestive, but this is not always present in cases of myeloma. Sternal

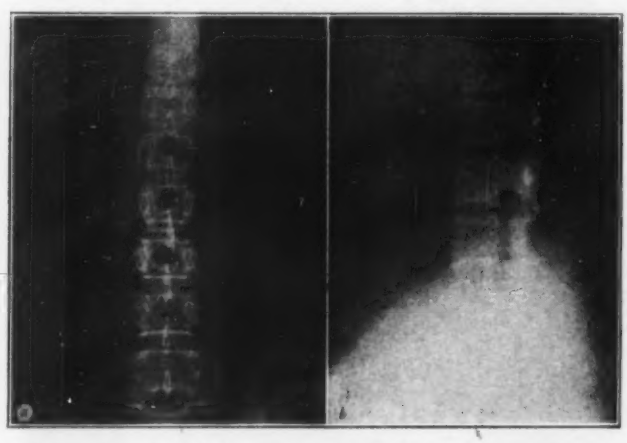

Fig. 4.—Asymptomatic hemangioma of first lumbar vertebra: *a*, anteroposterior view; *b*, lateral view.

aspiration and examination of the aspirated bone marrow by an experienced hematologist may be the deciding factor in the diagnostic procedure. At times, observation for a period of months may be necessary in order to make a definite diagnosis.

Of the benign tumors involving the vertebrae, the most common lesion is hemangioma (fig. 4). This lesion is by no means common, however. Schmorl [1a] found hemangiomas in over 10 per cent of all vertebrae examined. Most of these represented microscopic hemangiomas of no clinical significance. Adson and I [2] found records of 39 cases of recognized hemangioma of the vertebrae in the files of the Mayo Clinic. In about half of these the lesion was asymptomatic and was discovered in various types of routine roentgenographic examination. Thus it will be seen that this lesion is not an important cause of backache. Its recognition, however, is important, and one should bear it in mind when examining persons complaining of backache.

1a. Schmorl, G.: Die gesunde und kranke Wirbelsäule im Röntgenbild, Fortschr. a. d. Geb. d. Röntgenstrahlen **43**: 74, 1932.

COMMENT

I have enumerated some of the lesions which may be the background of backache. The list is by no means complete, but it serves to illustrate that many conditions may be found which are adequate causative factors of backache. Ability to recognize these is of the utmost importance, and to one who may feel himself adequately versed in the problem of backache they should be familiar. Recognition of such lesions makes the diagnosis certain and serves to clear any doubt about the underlying lesion that may exist in many cases of backache. If treatment does not hold much promise, at least a proper prognosis can be given, and this often is very important to the patient.

THE NEUROLOGIC ASPECTS OF LOW BACK PAIN AND SCIATICA

DEAN H. ECHOLS, M.D.
NEW ORLEANS

There is an erroneous impression among physicians that many cases of chronic back pain are the result of disease of the spinal cord, spinal meninges or spinal nerves. The fact is that disease of these organs rarely causes back pain and, when it does, the pain is overshadowed by such symptoms as paralysis, anesthesia and pain at a distance from the spine. Probably less than 1 per cent of cases of back pain are caused by primary diseases of the central and peripheral nervous systems. These infrequent neurologic causes of back pain are classified and briefly discussed in the following paragraphs.

INTRACRANIAL DISEASES CAUSING BACK PAIN

Intracranial diseases causing back pain are rare and are mentioned here merely for the sake of completeness.

Subarachnoid Hemorrhage.—Blood may enter the spinal subarachnoid space when the head is injured, when a brain tumor bleeds or when an intracranial aneurysm ruptures. Regardless of the source of intrathecal bleeding, the symptoms are much the same except that they may be mild or severe, lasting for a few days or several weeks. There is pain in the head, neck and back. Nuchal rigidity and low fever are usually present. Often there may be accompanying pains in the extremities. The chief source of spontaneous subarachnoid hemorrhage is a leaking artery, frequently a congenital aneurysm in the region of the circle of Willis. If the first attack is not fatal, a patient may experience several such episodes over a period of years. At times the symptoms may suggest rheumatism, poly-

2. Ghormley, R. K., and Adson, A. W.: Hemangioma of Vertebrae, J. Bone & Joint Surg. **23**: 887-895 (Oct.) 1941.

This paper, in a symposium on "Backache," is published under the auspices of the Section on Orthopedic Surgery.

From the Division of Neurosurgery, Department of Surgery, Tulane University School of Medicine and the Section on Neurosurgery, Ochsner Clinic.

neuritis or influenza, but the apoplectic onset and the presence of blood in the spinal fluid dispel any doubts.

Medulloblastoma.—The malignant tumor of the cerebellum which occurs chiefly in early childhood sometimes metastasizes along the spinal subarachnoid space. Back pain results but rarely presents a diagnostic problem, since the cerebral symptoms are striking.

Postencephalitic Parkinsonism.—This condition is sometimes accompanied by back pain. This is the result of generalized rigidity which affects the entire musculature, including that of the back.

Encephalitis.—Although encephalitis is said to be a cause of back pain, the associated inflammation of the spinal meninges is probably responsible for this symptom.

Mental and Emotional Diseases.—Patients with certain psychoses and psychoneuroses have "tension states" in which muscles are held rigidly and abnormal postures are maintained. Severe backache and pain in the shoulders or occipital region are the physiologic results. Another mechanism occurs in anxiety states. A person worried about his health will look for symptoms of illness and consequently detects each discomfort that appears. Since backache is one of the commonest human symptoms, it is not surprising that neurotic patients complain bitterly of back pain which would scarcely reach conscious levels in stable persons.

Malingering.—Deliberate lying about back pain or gross exaggeration of mild symptoms is a possibility which must be considered in every patient who does not present objective findings such as spasm of the back muscles. The physician is usually on guard against simulation in industrial and military cases, but it must be remembered that other patients may have less obvious reasons for wishing to appear partially incapacitated.

In summary, there are few organic diseases of the brain giving rise to back pain. Psychoneurosis and malingering must be considered in every case of back pain which presents a diagnostic and therapeutic puzzle.

SPINAL CORD DISEASES CAUSING BACK PAIN

Contrary to a commonly held impression, intrinsic diseases of the spinal cord rarely cause back pain. Such diseases as combined sclerosis, amyotrophic lateral sclerosis, progressive spinal muscular atrophy, Landry's paralysis, Friedreich's ataxia, multiple sclerosis, syringomyelia, glioma of the cord and syphilitic myelitis are practically painless because there are no sensory end organs in the spinal cord. However, the resulting spastic paralysis or muscular atrophy may produce scoliosis and secondary back pain. The acute stage of poliomyelitis often produces pain in the back, neck and extremities which is caused by associated meningeal and nerve root irritation and not by the cord lesions. The lightning pains of tabes dorsalis, which sometimes affect the back, are due to lesions in the spinal nerves and not to the degenerative changes in the spinal cord. Rarely, slight discomfort or a burning sensation in the back is felt by patients who have intrinsic diseases of the cord. This poorly understood symptom is vaguely referred to as central and funicular pain.

INTRINSIC DISEASES OF SPINAL MENINGES AND NERVE ROOTS (INCLUDING THE CAUDA EQUINA) WHICH CAUSE BACK PAIN

Rarely is back pain a dominant feature of intrinsic diseases of the spinal meninges and nerve roots, because the accompanying radicular pain is so severe. Among the diseases in this group are meningitis (including that which accompanies anterior poliomyelitis), extradural cysts of the arachnoid, adhesive arachnitis, hypertrophic pachymeningitis, sarcoma of the meninges, meningiomas, neurofibromas and other tumors of nerve roots or meninges. The extramedullary spinal cord tumors, which eventually produce transverse myelopathy, may cause pain high in the back and tenderness at the level of the lesion, but a much more striking feature is the radicular pain resulting from compression of nerve roots. Thus "girdle pains," "intercostal neuritis" or "brachial neuritis" may be the earliest symptom of such a tumor. Tumors of the cauda equina, although incapable of producing transverse myelopathy, may in time cause extensive paralysis of the lower extremities and the sphincters. At times such tumors cause a certain amount of pain low in the back, but the predominant complaint is pain radiating down the back ("sciatic neuritis") or front of the thigh ("femoral neuritis"). The prolonged back pain which sometimes follows spinal puncture might appear at first glance to belong in the category of intrinsic disease of the meninges. However, this pain, as well as the localized back pain produced by stab and bullet wounds of the spine, is not the result of injury to meninges or roots but is the result of damage to the ligamentous structures of the spine. Smallpox, tetanus, typhoid and influenza are all characterized by severe back pain at one stage of the infection. The mechanism of this symptom is not clearly understood, but it is unlikely that it can be explained on a neurogenic basis.

In summary, the intrinsic diseases of the spinal meninges and nerve roots are usually painful, but the pain is felt along the course of the peripheral nerves much more than in the back. Only rarely need these lesions be considered in the differential diagnosis of chronic low back pain.

DISEASES OF PERIPHERAL NERVES (INCLUDING SYMPATHETIC NERVES) AS A CAUSE OF BACK PAIN

In general, tumors, injuries and inflammations of peripheral nerves cause pain along these nerves or in their peripheral distribution. Only rarely does intercostal neuritis, herpes zoster or other disease of the peripheral nerves cause predominant backache or back soreness. Dysfunction of the sympathetic nervous system can produce pain only by producing paralysis or spasm of blood vessels. Such pain is probably never located solely in the back.

LESIONS OF BONES, JOINTS, LIGAMENTS, VESSELS AND OTHER STRUCTURES OF SPINAL COLUMN WHICH COMPRESS OR IRRITATE SPINAL CORD, MENINGES AND NERVE ROOTS WITH RESULTING BACK PAIN

In this category are tumors of the vertebrae (sarcoma, metastatic carcinoma, myeloma, hemangioma), tuberculosis and other infections of the vertebrae, extradural spinal abscess, intraspinal varices, fractures and fracture dislocations of the spine, infections and injuries of intervertebral disks, spondylolisthesis and arthropathies. Although compression of the cord, roots, meninges and their vessels by a tumor or dislocation of the spine may result in a certain amount of pain in the back, probably 95 per cent of the back pain arises from the diseased or injured bones, joints, ligaments, muscles and vessels of the spine. Often a striking feature of vertebral disease (fracture, tumor,

ruptured disk) is pain at a distance from the spine, as in the hip, gluteal region or thigh. Such pain may be referred (direct irritation of a nerve root) or reflex pain (impulse originating in damaged tissue and traveling to the cord over a primary posterior division of a spinal nerve, synapse in the cord and retrograde reflection along the primary ventral division of the same spinal nerve).

The intrinsic diseases of the spinal column listed in the preceding paragraph are of primary interest to the orthopedic surgeon. The neurologist and neurosurgeon are not concerned with them unless the spinal cord or nerve roots are compressed or invaded. For example, a tumor of a vertebra is given roentgen therapy and back support until symptoms of spinal cord compression demand decompressive laminectomy. Another example is fracture or fracture dislocation of the spine without cord compression; this is treated by reduction and immobilization. If chronic radicular pain should result from compression of a root by the dislocation, laminectomy and posterior rhizotomy might be required. Thus it is seen that certain diseases and injuries of the spinal column eventually encroach on the nervous system and come to the attention of the neurosurgeon. Most important of these lesions, from the point of view of back pain, is the ruptured intervertebral disk.

RUPTURED INTERVERTEBRAL DISK AS A CAUSE OF PAIN IN THE LOWER BACK

Why intervertebral disks rupture is not entirely clear. The fact that multiple ruptured disks are often found in cadavers suggests predisposing factors, such as degenerations or congenital imperfections of the disks. Only about 60 per cent of patients operated on for ruptured disk can attribute the symptoms to a definite back injury. Probably the repeated stresses of lifting, bending and jumping are sufficient to cause disk disruption in many persons.

Whereas any intervertebral disk can rupture (autopsy reports), in 95 per cent of the clinical cases it is the fourth or fifth lumbar disk. Herniation of the third lumbar or sixth cervical disk is occasionally seen. Protrusion of the others is rarely encountered.

The central portion of a disk (nucleus pulposus) is a gelatinous material which is held in position by two plates of hyaline cartilage and the fibrocartilaginous rings of the annulus fibrosus. Any disease or injury which destroys the continuity of these structures permits part of the semifluid nucleus pulposus to escape either into the body of the adjacent vertebrae or into the spinal canal. Escape in other directions is rare because the annulus fibrosus is stronger anteriorly and laterally. Probably a patient begins to have back pain as soon as the nucleus escapes. The exact mechanism by which an injured disk produces pain is not entirely clear, even though sensory nerve fibers are known to be present in each disk. It has been repeatedly observed that back pain is produced when the interior of a disk is curetted out under local anesthesia. This pain is probably due to stretching of either the anterior longitudinal ligament or the rings of the annulus fibrosus. However, other mechanisms for the production of back pain must be considered. As the ruptured disk becomes atrophied and flatter, the entire disk bulges at the periphery. This results in painful stretching of the posterior and anterior longitudinal ligaments of the spine. Also a narrowing disk permits an abnormal strain to be placed on the adjacent articular facets. Painful subluxations and degenerative changes in the joints may result. Finally, reflex spasm of the erector spinae muscles may cause fatigue, soreness and pain in the back.

Character of Back Pain.—Since many patients with sciatic pain due to a ruptured disk give a history of preceding attacks of back pain, it is possible to describe the syndrome of ruptured disk without nerve root compression. At the onset, immediately after rupturing a disk while lifting a heavy object, the patient may experience a knifelike pain near the lumbosacral joint or just to one side of this region. Severe pain may persist for many days or several weeks. The fact that many patients locate the pain at one sacroiliac joint once led to the excessive use of the term "sacroiliac strain." In some cases the pain extends entirely across the lower part of the back. It is accompanied by spasm of the back muscles and scoliosis. The back pain (often called lumbago) eventually subsides only to recur in distinct attacks which are precipitated by unusual strain on the injured disk. Lifting, turning over in bed in an awkward manner or a long automobile ride may produce a recurrence. The patient may be partially incapacitated for days or a week. During the chronic stage of ruptured lumbar disk some patients, on arising in the morning, feel back pain and stiffness which lasts for approximately an hour. Some have enough back pain with every attempt at lifting to force them to change occupations.

Diagnosis of Low Back Pain without Sciatic Pain.—Ruptured disk as the cause of low back pain without sciatic pain can be suspected on the basis of the character and the location of the pain, but because confirmation is lacking orthopedists and neurosurgeons are reluctant at the present time to make this diagnosis. There are too many lesions of muscles, joints and ligaments that can produce a clinical picture which is almost identical.

Roentgenograms of the lumbar spine and pelvis are usually negative in cases of ruptured disk. Narrowing of the disk of sufficient degree to be detectable with the patient lying down is an inconstant finding. Furthermore, a narrow lumbar disk is not sufficent evidence to conclude that the back pain is being produced by that disk. Narrow disks, due to long standing rupture, can often be found in patients who have never had back pain. Obviously, no one but an orthopedic surgeon should presume to make a diagnosis of ruptured disk as a cause of low back pain in the absence of sciatic pain.

Myelography with iodized oil has been employed by some in an attempt to demonstrate intraspinal protrusion of a disk as the cause of back pain in the absence of sciatic pain. However, a ruptured disk can cause back pain long before it protrudes sufficiently to produce an abnormal spinogram. For this and other reasons, myelography is not considered an acceptable procedure in cases of chronic low back pain without sciatic pain.

Intraspinal surgery has not been employed in the treatment of suspected ruptured disk causing low back pain without radiation down the lower extremity.[1] At the present time spinal fusion is the only recognized operation for pain of this type.

1. Dr. Walter Dandy stated that he had performed disk excision in 20 cases of low back pain not associated with sciatic pain (Southern Surgical Association, New Orleans, Dec. 7, 1943).

Mechanism by Which Ruptured Lumbar Disk Causes Sciatic Pain and Other Symptoms.—A lower lumbar disk is more liable to rupture into the spinal canal than elsewhere because the annulus fibrosus is weakest posteriorly. When such a rupture occurs, the nucleus pulposus escapes into the spinal canal. Later, or at the time of the original injury, portions of the torn layers of the annulus fibrosus also herniate into the canal. For anatomic reasons escaping disk tissue generally protrudes to one side of the midline. Such extruded tissue is usually not free to migrate down the spinal canal but is held at one point by areolar tissue and the plexus of veins on the anterior wall of the canal. Eventually, these tissues form a definite capsule for the extruded fibrocartilage. Such a lesion is called a disk nodule (knorpelknoten of Schmorl, 1926). In other cases a nodule is not formed, but a part of the disk (which has already lost most of its nucleus pulposus) bulges considerably into the spinal canal when the patient is erect because most of the deeper layers of the annulus fibrosus are broken.

Both types of rupture, if sufficiently large and strategically located, will stretch or compress a nerve root. Early irritation of a nerve root by rupture of the fourth or fifth lumbar disk produces pain in the region of the hip or buttock. More severe damage to the root causes pain along the course of the nerve fibers, usually as far as the ankle and sometimes as far as the toes. Since the fibers of these nerve roots help to form the sciatic nerve, it is acceptable practice to refer to this type of pain as "sciatica" or "sciatic pain." Technically, it should be spoken of as fifth lumbar radiculitis (or first sacral radiculitis).

Severe compression of a nerve root by a ruptured disk causes subjective numbness and sometimes demonstrable sensory changes in the distribution of the root (calf, foot, toes). Also impaired function of the nerve root results in interruption of tendon reflexes and weakness of muscles.

Diagnosis of Ruptured Intervertebral Disk Causing Sciatic Pain With or Without Low Back Pain.—As previously mentioned, a ruptured lumbar disk can produce back pain without radiculitis (sciatica). Conversely, a ruptured disk can cause pain down the lower extremity without low back pain. In the majority of the latter type of cases the low back pain has run its course and only the sciatic pain persists. Often the disappearance of the back pain is simultaneous with the onset of the leg pain. However, most patients with a ruptured disk have both back and sciatic pain, with one or the other predominating. In the majority of cases the pain in the buttock and hip is dominant. Rarely the pain in the calf overshadows the other discomforts.

The diagnosis of ruptured disk causing sciatic pain is based largely on the history and the patient's explanation of the character and location of the pain. The principal point to inquire about in the history is the occurrence of attacks of low back pain over a period of months or years.

The second point of major importance regards trauma. Did an injury precede the first attack of lumbago? Were successive attacks brought on by lifting? Did a final back injury or strain initiate the radiation of pain into the hip and thigh?

Of fundamental importance in diagnosis is the location of the pain in the back and leg. In ruptured fourth and fifth disks the pain is located on the posterior or lateral aspects of the thigh and on the posterior, lateral or anterolateral aspects of the leg. Pain in the big toe points to a ruptured fourth disk; pain in the little toe implies a ruptured fifth disk. Pain along the medial and anterior aspects of the thigh suggests rupture of the second or third lumbar disk (4 per cent of cases). Cases of rupture of the first and second lumbar disks are surgical curiosities.

Sensory changes (numbness, tingling) are present in patients with severe sciatic pain. These are usually experienced in the calf, foot and toes and correspond to the dermatome of the compressed root. Hypesthesia and hypalgesia may at times be demonstrated with careful tests.

If the fifth disk is ruptured, the ankle jerk may be diminished or absent. Ruptured fourth disk rarely disturbs this reflex. Ruptured third disk may impair the patellar reflex. Atrophy of muscles is not ordinarily detectable in cases of ruptured disk, but weakness can often be demonstrated by asking the patient to stand on the heel or the ball of the foot.

Since pain in the hip and leg is caused by mechanical compression or stretching of a single (rare exceptions) nerve root, certain physical factors aggravate or decrease the pain. Coughing, sneezing, straining at stool, flexing the neck, bending, lifting and sitting for long periods are such factors. One or more of these is described by every patient. Certain positions, such as lying down, may give partial relief. Most of these patients limp.

In the majority of cases of sciatica due to ruptured disk the leg pain is increased by flexing the thigh with the knee extended. Prolonged compression of the jugular veins (Naffziger test) also increases the leg pain and the paresthesias.

In at least 90 per cent of cases severe enough to require operation there is spasm of the back muscles, back tenderness or both. Lumbar lordosis may be completely absent, and there may be a list of the lumbar spine toward or away from the side of the sciatic pain. Pressure on the fourth or fifth lumbar spinous processes or just to one side of these discloses tenderness and increases the back pain. It may cause radiation of pain into the hip and on down the leg. The explanation for the latter phenomenon is that pressure is transmitted directly through the interlaminal space to the nerve root, which is already incarcerated between the protruding disk and the ligamentum flavum.

It is axiomatic that every candidate for disk surgery should have adequate roentgenograms of the lumbosacral portion of the spine. Omission of such films has resulted in failure to recognize metastatic carcinoma, primary tumor of a vertebra and spondylolisthesis. It is also important that every patient should have the benefit of orthopedic examination and opinion before submitting to disk surgery. In the atypical cases the orthopedist may even be able to disprove the diagnosis of ruptured disk and avert a negative exploration. Moreover, it is still believed by many that certain patients with chronic back pain and sciatica require spinal fusion as well as removal of the diseased portion of the disk. If a patient is unwilling to undergo the combined operation, he should at least be aware that persistence of back pain after disk removal is a possibility in his case. The decision for fusion is based principally on a long history of severe back disability,

the demonstration of malformations of the lumbosacral joint and knowledge of the fact that the patient must earn his living by heavy labor.

Of fundamental importance in the problem of ruptured disk with sciatic pain is the fact that nonsurgical orthopedic treatment may, and frequently does, relieve all or most of the pain either temporarily or permanently. It would therefore seem unwise to deprive patients of at least a brief trial of orthopedic management before advising hemilaminectomy.

At the present time the diagnosis of ruptured intervertebral disk is usually based on the history, the description of the current symptoms, roentgenographic, neurologic and orthopedic findings and the type of response to orthopedic treatment. However, some surgeons prefer to exhaust the possible diagnostic aids, which include spinal fluid analysis and myelography. At least 50 per cent of cases of ruptured disk have an increase in total protein content but no other changes. Fluoroscopic studies of the spine after intrathecal injection of radiopaque iodized oil disclose the majority of ruptured disks that are causing sciatic pain. However, many disk nodules are placed so far laterally that they are not visible in the myelogram. Visualization of the dural sac after the injection of air is practiced in only a few clinics because of technical difficulties. In general, it can be said that most disk surgeons use spinal puncture and myelography only in doubtful or atypical cases, including those of suspected rupture of the second and third disks.

Differential Diagnosis of Sciatica Due to Ruptured Intervertebral Disk.—Sciatic pain without back pain can be produced by various lesions of the sciatic nerve. Such lesions include direct injury to the nerve and adjacent tissues from fractures and bullet wounds of the pelvis. In these cases the paralysis and anesthesia are much more striking than in cases of ruptured disk. Painful neuritis of the sciatic nerve can also be produced by exposure to cold and by infection or intoxication (alcohol, lead, arsenic, puerperal infection and infections of the teeth, tonsils and prostate gland). Such cases are now only infrequently encountered. The once popular diagnosis of toxic sciatic neuritis used to include all cases of ruptured intervertebral disk. In true neuritis of the sciatic nerve there is tenderness along the nerve trunk and complete absence of symptoms and signs referable to the back. Sciatic neuritis may resemble ruptured disk radiculitis in all other respects except that it is usually of only a few weeks duration. Flatfoot has been established as an indirect cause of leg pain. Inflammation of the sacroiliac joint or the overlying pyriformis muscle can cause sciatic pain by direct involvement of the sciatic nerve. Likewise a hypertrophied ligamentum flavum can produce leg pain by compressing a nerve root in its intervertebral foramen. These and other infrequent or questionable causes of sciatic pain should be considered in turn by the orthopedist when studying alleged cases of ruptured intervertebral disk, particularly when an atypical syndrome is presented.

Tumors of the cauda equina may cause sciatic pain, but never does such a tumor produce the complete syndrome of ruptured disk. Conversely, a large protrusion of a disk may compress the cauda equina and simulate tumor. Obviously, a tumor of a nerve root in the intervertebral foramen (extremely rare) or a bone tumor (metastatic carcinoma, sarcoma) which compresses the nerve within its foramen would mimic the syndrome of a ruptured disk and make a correct differential diagnosis difficult.

Of great assistance in the differential diagnosis is knowledge of the fact that ruptured disk is relatively infrequent in women (less than one third of cases) and is almost nonexistent after the age of 50.

Congenital malformations of the fifth lumbar vertebra, including spondylolisthesis, often produce both low back pain and unilateral or bilateral leg pain. The pain in the leg rarely extends below the knee, as it is reflected pain and not referred pain due to compression of the nerve in the lumbosacral foramen. However, real sciatic pain may be associated with spondylolisthesis, in which case the pain is caused either by an associated rupture of the lumbosacral disk or by pinching of the nerve in its foramen.

Arthritis of the spine, a diagnosis often used erroneously to explain cases of sciatica due to ruptured disk, sometimes imitates the disk syndrome. However, the leg pains are usually diffuse and limited to the hips and thighs. Almost never is there numbness in the calf and foot. Unlike cases of ruptured disk, the back pain is not localized to one region and the orthopedic findings are entirely different. Moreover, disabling arthritis usually occurs in an older age group. For these reasons the roentgen demonstration of moderate arthritis of the spine should not mislead us when the typical signs and symptoms of ruptured disk are present.

In summary, it must be assumed that a patient has a ruptured intervertebral disk if he is partially incapacitated by chronic or recurring pain in the lower back and pain which radiates from the hip to the calf of one or both lower extremities. Although the other possible causes of this syndrome should be considered, particularly (1) spondylolisthesis, (2) metastatic carcinoma, (3) tumor of the cauda equina and (4) congenitally defective fifth lumbar vertebra with resulting destruction of the articular process, the burden of disproving the diagnosis of ruptured disk rests largely on the orthopedic surgeon.

In closing, I would like to refer to the roles played by the orthopedic surgeon and by the neurosurgeon in the diagnosis and treatment of sciatic pain associated with low back pain. Disease of a disk is fundamentally an orthopedic problem and should be of no interest to the neurosurgeon unless and until nerve root compression and incapacitating sciatica develop. The management of recurring back pain, with or without mild hip and sciatic pain, consists of such measures as physical therapy, bed rest, leg traction, plaster jackets and back braces. These procedures are effective in getting a high percentage of patients back to work. In most communities, by mutual agreement, the orthopedist transfers the patient to the neurosurgeon when it becomes apparent that disk removal is required. Such cooperation is of the utmost importance to the patient and is evidence of the high degree of specialization that the orthopedic profession has attained. The neurosurgical fraternity should make equal efforts, in the interest of the patient and its own integrity, to cooperate with the orthopedists in the diagnosis and management of cases of ruptured disk and should avoid the tempting short cut of immediate laminectomy in all cases coming to its attention.

3503 Prytania Street.

BACK PAIN

IN DISEASE OF THE GASTROINTESTINAL AND ACCESSORY GASTROINTESTINAL TRACT

ANDREW B. RIVERS, M.D.
AND
ANDRIES I. ROODENBURG, M.D.
Fellow in Medicine, Mayo Foundation
ROCHESTER, MINN.

Patients who have maladies involving digestive or accessory digestive organs, such as the gallbladder or the pancreas, frequently complain of pain in the back. Nor is this complaint of minor importance symptomatically to many of these patients. Indeed it is often the presenting, or even the sole, complaint. It may overshadow other symptoms in severity, and only careful evaluation will elicit the information that it is but one of the manifestations of a disease located in the gastrointestinal or accessory gastrointestinal tract. All of the diseases involving these tracts may cause pain referred to the back, and much information of the highest diagnostic and prognostic importance will be lost if such distress is not evaluated carefully. Accurate localization of the involved organ or of erosive progression of histopathologic processes or even the detection of involvement of neighboring organs in the course of progression of a disease may be possible by means of critical scrutiny and proper evaluation of references of pain from the epigastrium to the thorax, neck or back.

A CONSIDERATION OF MECHANICS AND PATHWAYS OF PAIN IN ABDOMINAL DISEASES

Our objective in writing this paper is to set forth certain clinical facts regarding pain and especially back pain which we utilize daily in our evaluation of patients' complaints. Thus, for instance, if the patient who has duodenal ulceration states that his previously mild and poorly localizable epigastric two hour postprandial pain has become more severe, has lost some of its rhythm and is now felt in the right upper quadrant and from there is referred into his thorax and the right side of his back, we assume that this ulcer has spread to involve tissues contiguous to its place of origin. Morley [1] would explain the mechanics of this shift of pain or, as he termed it, referred pain as due to the fact that such painful impulses are now relayed to the spinal cord over branches of the "sensory spinal nerves" which supply the parietal peritoneum and some of the appendages of the posterior abdominal wall and tissues contiguous to the abdominal viscera, and that the impulses are transmitted to superficial branches of such nerves as, for instance, the intercostal nerves.

Morley expressed the belief that "referred pain only arises from irritation of the nerves which are sensitive to those stimuli that produce pain on the surface of the body." We have accepted the fact that the spread of disease processes from viscera into tissues guarded by spinal sensory nerves can, and frequently does, result in a shift of pain into potential pathways of this group of nerves. This is of practical clinical importance from diagnostic, therapeutic and prognostic standpoints.

The "referred" pain of peptic ulceration, however, does not always indicate that such an ulcer has progressed beyond the confines of the viscus. In 1934 one of us [2] studied a series of about 400 peptic ulcers, surgically verified as to location and involvement of tissue. More than 90 per cent of patients who had penetrating lesions exhibited definite shift of original pains into secondary regions, such as the thorax or the back. Most instances of uncomplicated peptic ulcer did not exhibit any shift of pain into secondary regions. The larger or the more inflammatory ulcers, however, exhibited some tendency to produce referred pain from the epigastrium to the thorax or back. Because of this the statement then was made "I am not convinced that pain transmitted over the splanchnic route cannot be projected into secondary areas."

This lends further clinical corroboration to the suggestions made by Leriche,[3] Lewis,[4] Palmer [5] and others that nerves originating in abdominal viscera and coursing from there along splanchnic branches of the sympathetic nerves to the spinal cord are capable of mediating pain referred into secondary regions, and indeed (Lewis) that they are fundamentally no different from the sensory spinal nerves. This might lead to the implication that the great highway of traffic of impulses from viscera to spinal cord over the sympathetics is regularly no differently sensitive than are the nerves of the cutaneous system. It would be a bit difficult to correlate this with clinical facts, at least so far as gastrointestinal diseases are concerned. It is almost universally true that shallow, well localized intravisceral disease which would engage afferent nerves using the splanchnic route produces distress which is poorly localizable and but seldom referred with detailed directional consistency from its place of origin into secondary regions. Furthermore, it is difficult to imagine the dilemma of the cortex being required to parse, analyze and appease all the heterogeneous impulses thrust on it by the protesting mucosa of the gormandized human stomach if its nerves were no less differentiating or discriminating than are those supplying the skin. It is suggested that impulses from viscera running along splanchnic pathways, admittedly sensory pathways, ordinarily utilize specialized stimuli to initiate and appreciate painful impulses. Hurst and Stewart [6] expressed the belief that the only stimulus adequate to produce visceral gastric pain is tension of the nerves on the muscular wall of the viscus.

Palmer has shown that visceral pain may be induced by injections of 0.5 per cent hydrochloric acid into the stomachs of patients having gastric ulcers. It has also been demonstrated by Dragstedt and Palmer [7] that rubbing the serosa overlying a duodenal ulcer will produce pain. In all probability there are many stimuli adequate to cause pain along sympathetic routes if the summation of impulses is sufficiently irritative, widespread or prolonged to activate and charge the pain receptors spread out through the visceral wall. Under such circumstances the entire sensory pathways making up the involved segment of the spinal cord could participate in this pain interpretation, the more differentiating

From the Division of Medicine, Mayo Clinic (Dr. Rivers).
This paper, in a symposium on "Backache," is published under the auspices of the Section on Orthopedic Surgery.

1. Morley, J.: Abdominal Pain, New York, William Wood & Company, 1931, p. 174.

2. Rivers, A. B.: Pain in Benign Ulcers of the Esophagus, Stomach and Small Intestine, J. A. M. A. **104**: 169-173 (Jan. 19) 1935.

3. Leriche, R.: Des douleurs provoquées par l'excitation du bout central des grands splanchniques (douleurs cardiaques, douleurs pulmonaires) au cours des splanchnicotomies, Presse méd. **45**: 971-972 (June 30) 1937.

4. Lewis, T.: Pain, New York, Macmillan Company, 1942, p. 140.

5. Palmer, W. L.: The Pain of Peptic Ulcer, A. Research. Nerv. & Ment. Dis., Proc. **23**: 302-326, 1943.

6. Hurst, A. F., and Stewart, M., cited by Morley.[1]

7. Dragstedt, L. R., and Palmer, W. L.: Direct Observations on the Mechanism of Pain in Duodenal Ulcer, Proc. Soc. Exper. Biol. & Med. **29**: 753-755 (March) 1932.

or sensitive of these being the ones clamoring the loudest and making the most impression on the patient's consciousness.

A review of the various hypotheses regarding abdominal pain brings into prominent view several facts which are of great clinical interest and importance. Pain impulses from viscera to spinal cord use not one but several important traffic highways. Probably the most important normally is along sensory nerves in the splanchnic branches of the sympathetic nerves. Some specialization of stimuli adequate to produce pain is essential in this route. Most likely, unusually potent stimuli cause such pain to be referred at times into regions distant from their point of origin. Thus back pain might occur in cases in which lesions involve the gastrointestinal or accessory gastrointestinal tract even though the lesions remain confined to their place of origin within the visceral wall. A referred pain, however, usually indicates an extensive lesion. Such back pain is as a rule poorly localizable, although maintaining some segmental relationship, and may be felt bilaterally.

Of equal clinical importance is the "emergency" highway using spinal somatic nerves. The trivial irregularities of visceral disturbance are probably within the realm of the splanchnic nerves. With invasion of tissue contiguous to viscera, the nerves guarding these regions come into use. Thus the lesion comes directly into the scope of the spinal somatic nerves which innervate parietal peritoneum and some of the appendages of the posterior wall, such as part of the mesentery and mesocolon (Morley). If clinical experience is dependable, this results in more definitely localizable referred pain, frequently finding its way into the potential superficial references of this same involved nerve. This has been true so consistently that when a patient who has a known lesion in the gastrointestinal tract and who formerly experienced a poorly localizable epigastric pain complains that the pain recently has become more sharp or cutting than formerly, that it is continuous, that it is associated with tenderness, that it is now more severe unilaterally than it was and that it is felt in the back ipsilaterally, we assume that we are dealing with a penetrating type of lesion. Such a pain usually is localized accurately and corresponds segmentally with the intra-abdominal region invaded by the penetrating lesion.

A third important pathway for pain which can be used in disease involving the upper part of the abdomen is the phrenic nerve. Gastric lesions progressing to involve regions supplied by this nerve are likely to produce a pain referred into the shoulder tip or over the suprasternal or supraclavicular region.

Sensory impressions from the digestive or accessory digestive organs may also reach the patient's consciousness along the ganglionated chain and aortic plexuses or perhaps even along the vagus nerves.

We have dwelt at some length on the more important nervous pathways involved in diseases of the gastrointestinal or accessory gastrointestinal tract. We have also discussed some of the factors dealing with the mechanics of production of pain in such diseases. This we did because we felt that it was an essential background to the discussion of back pain in gastrointestinal diseases.

Several times in this paper we have referred to peptic ulcer as illustrating certain characteristics of pain. What applies to peptic ulcer applies equally well to other lesions included in this discussion. The mechanics is the same.

ORGANS INCLUDED IN THIS DISCUSSION

The organs involved primarily or in a contributory sense in the function of the gastrointestinal or accessory tract would include too many anatomic structures for discussion in this paper. We shall limit ourselves therefore to those more or less directly contiguous to it, such as the esophagus, stomach, small bowel and colon, as well as the liver, bile ducts, gallbladder and pancreas. In diseases of some of these, such as the small bowel, back pain is rarely noticed; in diseases of others, such as the pancreas, it frequently is the most prominent and occasionally the sole complaint.

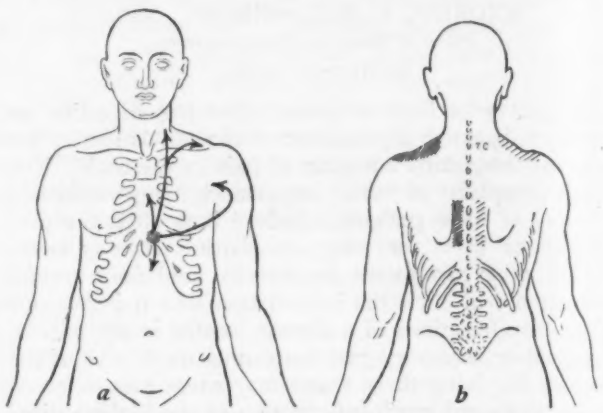

Fig. 1.—Locations of origin and reference of pain produced by lesions involving the lower part of the esophagus. In *a* the shading indicates the location of original pain and the arrows indicate the directions of reference. In *b* the shading indicates the regions to which pain is referred.

Esophagus.—In a recent article dealing with pain in diseases of the esophagus, Moersch and Miller [8] suggested a division of the esophagus into an upper and a lower part to simplify the consideration of its symptoms. Lesions of the upper part are usually associated with pain which is fairly well localized over that part of the sternum which corresponds segmentally to the position of its causative lesion. If present, pain in the back has a similar distribution. The distribution of pain due to lesions of the lower part of the esophagus (fig. 1) is more complex than that of pain due to lesions of the upper part, probably because of their proximity to the diaphragm. In such instances there is a wider reference of pain into secondary regions.

(*a*) Carcinoma: Carcinoma of the esophagus produces pain, especially when it is obstructive, ulcerating or infiltrating into the contiguous structures. The quality varies from a mild burning sensation to an excruciating agony. Frequently the pain is localized over the midportion of the anterior thoracic wall, and extension to the interscapular region is often observed. At times the pain in the back is the chief complaint. The pain is felt more frequently to the left than to the right of the spinal column, although right-sided or bilateral localizations do occur. Malignant lesions of the lower part of the esophagus occasionally cause extension of pain into the neck or the face.

(*b*) Esophagitis: The pain produced by esophagitis is mild. It is distributed over the anterior and posterior aspects of the thorax in regions roughly corresponding segmentally to the diseased part. Upward extension of the pain is sometimes noted. There may be slight aggravation of the pain associated with swallowing.

8. Moersch, H. J., and Miller, J. R.: Esophageal Pain, Gastroenterology **1**: 821-831 (Sept.) 1943.

(*c*) Cardiospasm: The pain of cardiospasm may be sharp and may be located over the left lower costosternal articulations and extend directly "through and through" to the back. At times the back pain extends upward into the interscapular region. Reference of the pain into the neck, ears, face, shoulder, left arm and occasionally right arm is sometimes found. For the discussion of its underlying mechanisms we refer to the paper by Moersch and Miller.

(*d*) Diaphragmatic Hernia: Diaphragmatic hernia is fairly common. In hiatal hernia, pain may be the most prominent symptom. Its presence does not necessarily denote the presence of an ulcer in the herniated part of the stomach. The pain is usually most intense infrasternally to the left of the midline and in the back. The referred pain may follow the left costal arch or it may be perceived as stabbing "through and through" to the thoracic spinal region.[9] At times—and this seems to be especially the case if the hernia is small—the pain extends upward into the interscapular region or higher into the neck, the jaws and the ear, and this more frequently on the left than on the right side. The pain has been observed to start in the back, extending upward and around the left side, and in the end involving the entire left side of the thorax. Contrary to the general belief, small hernias may be the cause of extremely severe pain. The extension of pain into the shoulder and neck in cases of diaphragmatic hernia is usually in the left phrenic distribution, although occasionally, and especially if incarceration of the hernia occurs, the right phrenic region also is involved. The pain of an incarcerated hiatal hernia is extremely severe and often widespread. It may originate substernally or in the midthoracic spinal region in the back. The pain may be limited to the back. At times the entire left side of the thorax is full of severe pain, and this may spread to involve the right side. Occasionally, probably because of involvement of the peripheral portion of the diaphragm, there is extension of pain over the upper part of the abdomen.

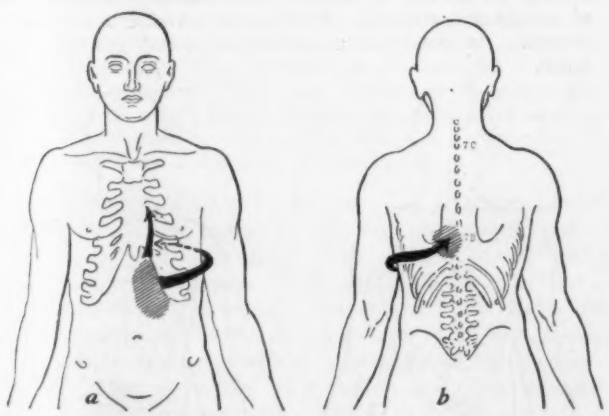

Fig. 2.—Distribution of pain produced by gastric ulcer. In *a* the shading indicates the usual location of pain and the arrows indicate the directions of reference. In *b* the shading indicates the region to which referred pain shifts most frequently.

Stomach.—(*a*) Gastric Ulcer: As has been pointed out earlier in this paper, size, acuity and penetration are the most important factors determining localization, distribution and the character of the pain in peptic ulcer. Gastric ulcer will produce distress varying from a gnawing to a sharp pain, felt most frequently in the left side of the epigastrium (fig. 2). It may be referred laterally to the back or extend as a dull pain "through and through" to the back. Although this shifting of pain is not an invariable sign of penetration into tissue contiguous to the stomach, it occurs more often when such invasion has taken place than when it has not. The back pain then may be very severe, and it is more often felt to the left than to the right of the lower thoracic portion of the spinal column.

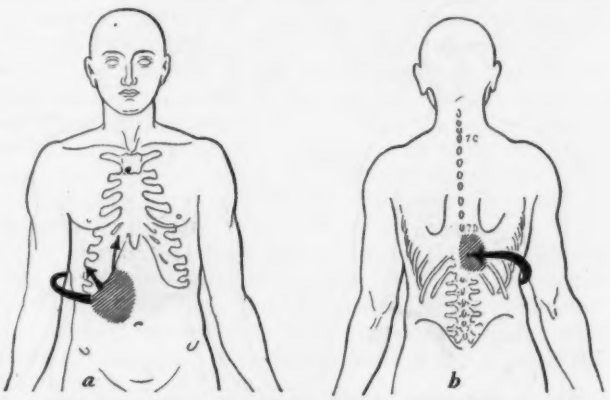

Fig. 3.—Distribution of pain produced by duodenal ulcer. In *a* the shading indicates the region where pain is felt most frequently and the arrows indicate the directions of shift into secondary regions. In *b* the shading indicates the most frequent location of back pain in the extensive or the penetrating type of duodenal ulcer.

Sudden severe pain in the back may be one of the signs of acute perforation. Its distribution depends partly on the course followed by the escaping gastric contents. Pain extending into the left shoulder and the neck is evidence of deep penetration with involvement of phrenic innervation.

(*b*) Gastric Carcinoma: Shifts of pain as described for gastric ulcer also occur in cases of gastric carcinoma. This lesion is notorious for the almost complete absence of warning pain. When in such cases pain begins to be an outstanding symptom—particularly if this pain is referred into secondary regions in the thorax and back (same region as in gastric ulcer)—it is almost certain that the lesion has invaded contiguous structures and therefore has become inoperable.

Duodenum.—(*a*) Duodenal Ulcer: The pain of duodenal ulcer is felt in the pit of the stomach or, more often, it is vaguely localizable to a region to the right of the midline and slightly above the umbilicus (fig. 3). If the pain extends from there into secondary regions, this occurs usually to the right costal margin into the thorax and around to the back. When the pain is severe it may extend "through and through" to the back. This occurs occasionally in cases of large, acute ulcers associated with extensive duodenitis and usually when the ulcer has penetrated to invade contiguous tissues. Localization of the dorsal pain is usually at the level of the ninth and tenth thoracic vertebrae to the right of the spinal column. The pain of perforation of a duodenal ulcer is identical with that of perforation of a gastric ulcer. A shift of pain due to duodenal ulcer to the left usually indicates penetration to involve the pancreas (a bilaterally placed organ).

(*b*) Carcinoma of the Duodenum: Primary uncomplicated carcinoma of the duodenum is an extremely rare disease and is seldom responsible for pain in the back. Occasionally, carcinoma of a neighboring structure invades the duodenum and this may cause deep-seated back pain in the lower thoracic region.

9. Harrington, S. W.: Diaphragmatic Hernia, in Eusterman, G. B., and Balfour, D. C.: The Stomach and Duodenum, Philadelphia, W. B. Saunders Company, 1935, pp. 689-702.

Jejunum and Ileum.—(*a*) Gastrojejunal Ulcer: Occasionally a patient on whom gastrojejunostomy has been performed will complain of recurrent symptoms of ulcer (fig. 4). He localizes his pain over an area to the left of the umbilicus, and this pain frequently extends into the flank to a region just to the left of the

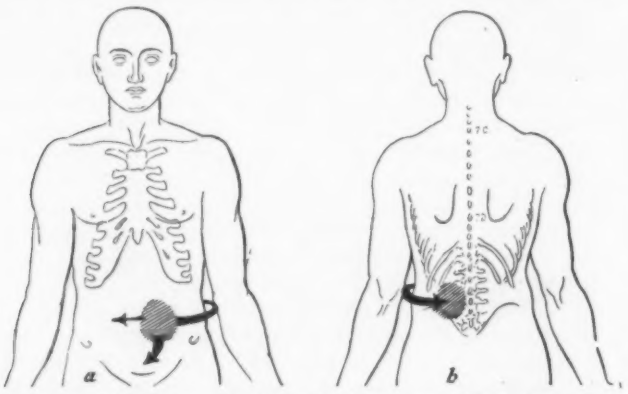

Fig. 4.—Distribution of pain produced by gastrojejunal ulcer. In *a* the shading indicates the region where pain is felt most frequently and the arrows indicate the directions of shift. In *b* the shading indicates the location of back pain in cases of penetrative stomal ulcer.

upper lumbar segment of the spinal column. Occasionally the back pain is felt over the entire upper lumbar segment. The extension of pain caused by gastrojejunal ulcer occasionally is mistaken for ureteral colic. At times such pain is referred into the inguinal regions. The pain comes on several hours after the ingestion of food and is relieved by the use of alkali or food. The distress varies greatly in severity. At times it is described as a disturbing sense of fulness and at other times it is very sharp.

(*b*) Meckel's Diverticulum: Meckel's diverticulum is a rare anomaly. As a result it does not produce back pain. Occasionally, however, it manifests its presence by back pain in the lumbar region and this is usually associated with pain felt anteriorly just below the umbilicus, either to the right or to the left of the midline. Ulceration may occur in the bowel contiguous to the diverticulum. This may lead to severe pain in the regions described.

(*c*) Intestinal Obstruction: A variety of causes may be responsible for intestinal obstruction. When the blocking is complete, severe abdominal pain usually occurs. With this there is frequently a severe, dull, diffuse back pain.

Colon and Rectum.—(*a*) Diverticulum: Ordinarily diverticulum of the colon does not produce any well defined symptoms. There may be some increase of irritability of the bowel manifesting itself in augmented spasticity. There may thus be flatulence and a distressing sensation of distention. At times there may be some infection associated with diverticula. Some localizing pain over the abdomen may then develop. Concomitantly there is then likely to be some back pain coinciding in location with the pain felt in the abdomen. With the formation of abscess, a complication which occurs fairly often, severe pain develops. Associated back pain is then the rule. Usually this can be utilized in arriving at accurate localization of the lesion because it corresponds quite definitely in segmental distribution to the intra-abdominal spinal nerves involved by this spread of the infectious process.

(*b*) Ulcerative Colitis: Back pain is, as a rule, not an outstanding characteristic of ulcerative colitis unless deep involvement of the intestinal wall results. Vague, diffuse lumbar back pain may occur in cases of ulcerative colitis. However, it is so overshadowed by other symptoms, such as abdominal pain and bloody diarrhea, that only careful questioning will elicit mention of it. Only when the disease becomes very extensive or exhibits penetrating characteristics is back pain very often noticed.

(*c*) Carcinoma of the Colon, Sigmoid or Rectum: Back pain in cases of carcinoma of the colon, sigmoid or rectum may be a very important symptom. It usually signifies a penetrating type of lesion. Carcinoma of the rectum may produce pain in the sacral region (fig. 5 *a*), whereas carcinoma of the sigmoid often produces pain in the lumbar region (fig. 5 *b*). Rarely the back pain may be the only complaint, as is demonstrated by the following case:

Case 1.—A man aged 61, two years prior to admission, had suffered onset of pain over the lumbar region as indicated in figure 5 *b*. At that time he noticed blood and mucus in the stool. One year later, obstructive features developed. These were of gradually increasing severity. The patient lost weight. Frequently bloody stools were noticed. At operation a perforating carcinoma of the second portion of the sigmoid was found.

Unfortunately, carcinomas of the ascending, transverse and descending colon seldom produce much pain except after the lesion, during the progression of its erosion, becomes fixed to a neighboring structure. Then there may result severe localizing pain, which frequently is felt through to the back, usually ipsilateral to the portion of the organ involved. The pain associated with mechanical disturbance caused by inadequate emptying of the bowel may be severe and may be felt in the back; however, unless penetration has occurred the distress is usually diffuse and poorly localized.

Pain over the sacrum, though rare, may be observed in association with carcinoma of the rectum, as demonstrated by the following case:

Case 2.—A man aged 42 had noticed pain over the sacral region (fig. 5 *a*) six months prior to admission. Occasionally he had noticed bloody stools. There had been a gradual loss of weight and strength. Proctoscopy revealed a mass in the rectum. At operation a perforating rectal carcinoma was found.

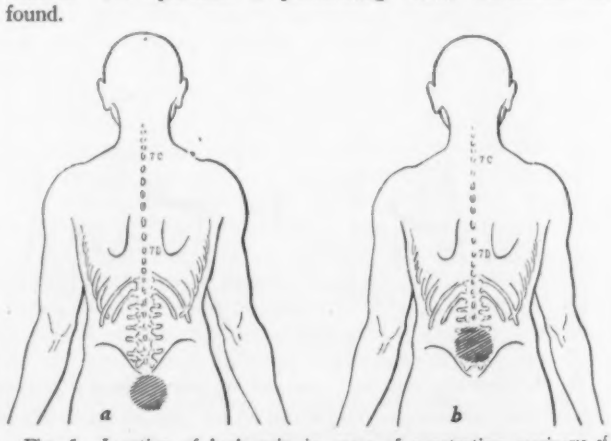

Fig. 5.—Location of back pain in cases of penetrating carcinoma of the rectum or sigmoid. Shaded areas indicate location of pain in cases of (*a*) carcinoma of the rectum and (*b*) carcinoma of the sigmoid.

Pancreas.—(*a*) Acute Pancreatitis: Pain associated with acute pancreatitis usually is extremely severe. It is usually maximal over the epigastrium and extends through to a rather diffuse region, frequently bilaterally located over the lower thoracic segment of the spinal column. The pain may also follow either costal arch, but more often it is described as going directly through

into the back. Often the back pain is more disturbing than that felt over the upper part of the abdomen.

(*b*) Carcinoma of the Pancreas: This frequently does not cause any pain, or only a vague epigastric distress may be present. However, here, as in carcinoma of the large bowel, pain may be the first symptom.

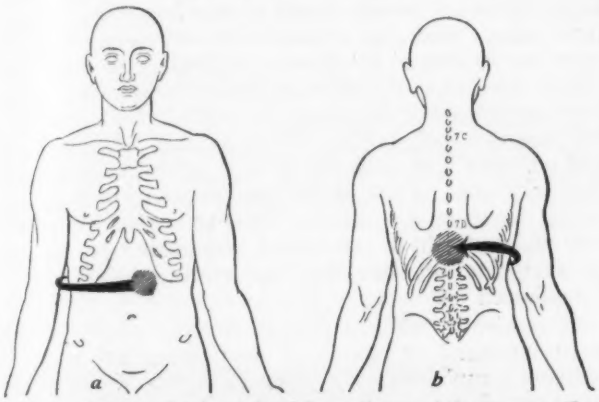

Fig. 6.—Location of pain produced by carcinoma of the pancreas (case 3). Pain originated in shaded area of *a* and was referred from there to the shaded area of *b*.

The distribution of this pain may be similar to the one described for acute pancreatitis, and fairly frequently the back pain is more severe than the epigastric distress and is noticed before the latter sets in. These patients often have found that sitting with the body bent forward eases their pain. Others find that they get some relief by lying on the stomach. The following case illustrates pain occasionally noted when there is a pancreatic neoplasm:

CASE 3.—A woman aged 39 had noted six months prior to admission a rather severe left epigastric pain, which extended from the left to the right side of the epigastrium. The anterior pain was then referred through into the back, as indicated in figure 6. This pain was a deeply located, boring type of distress. Once established, it was felt as a single pain front and back and it was demoralizingly severe. With this the patient had nausea, vomiting and fever. She was ill for several weeks; then for three months she did not have any severe pain. Two months prior to admission she observed a similar pain, which persisted. There was rapid loss of weight and strength. One month prior to admission, signs of obstruction of the biliary duct developed. At operation a carcinoma of the head and body of the pancreas was found.

Gallbladder, Bile Ducts, Liver.—(*a*) Diseases of the Gallbladder: The lower scapular or interscapular distribution of pain associated with disease of the gallbladder is well known. In typical biliary colic there is pain in the right upper quadrant of the abdomen fairly close to the costal margin. It is a dull, deep-seated, bursting pain which usually is projected through into the back, especially to a region over the inferior angle of the right scapula. There is a definite sense of fulness, and occasionally there are upper abdominal cramping and distention. Front and back pain are felt as a single pain. After a hypodermic injection of morphine they usually disappear at the same time, leaving but little residual tenderness. If acute cholecystitis is present, however, the pain does not disappear without residual manifestations. There is muscular spasm over the upper right quadrant. Pain is felt anteriorly over the right infracostal region and from there it is referred through or around into the right infrascapular and interscapular regions. There is not only a "through and through" soreness; the entire region overlying the lower ribs on the right is hyperesthetic.

Rupture of the gallbladder may produce an acute abdominal catastrophe that is similar in its general characteristics to that caused by perforated peptic ulcer. Fortunately, free perforation into the abdominal cavity rarely occurs. Usually leakage is slow and a walling off abscess results, or the perforation occurs into the gastrointestinal tract. With the formation of abscess, severe pain in the upper right quadrant may result. This usually is referred around or through into the right side of the back in the region of the lower thoracic vertebrae. Very rarely the pain may be in the left upper quadrant with projection over the left side of the back.

Though contralateral pain occasionally is noted in cholecystic disease, concomitant pancreatitis is more often responsible than uncomplicated cholecystic disease for this distribution of pain. It should be remembered that pain associated with disease of the gallbladder may be felt only in the back, and patients have described this as "lumbago." The following case is a good example of such an occurrence:

CASE 4.—A woman aged 21 had experienced three brief episodes of severe pain over the right inferior scapular angle in a period of two years prior to her admission. During these attacks she had also noted pain in the right side of the neck as indicated in figure 7. Several days before her visit here she had noted similar pain, to which now for the first time was added right epigastric pain. With all attacks she had had a slight elevation of temperature. At operation acute cholecystitis associated with stones was found.

(*b*) Biliary Pain After Cholecystectomy: Persisting or recurring pain following surgical removal of the gallbladder forms a topic which can be treated only briefly and very inadequately in this paper. After cholecystectomy, pain in the upper right quadrant which is felt through into the lower scapular region may persist because its cause may not have been cholecystic in the first place. The pain may have been due to one or more of many causes, such as radiculitis, intercostal neuralgia or a penetrating duodenal ulcer invading spinal nerves occupying the same segment of the spinal cord as the gallbladder. Retained stones in the bile

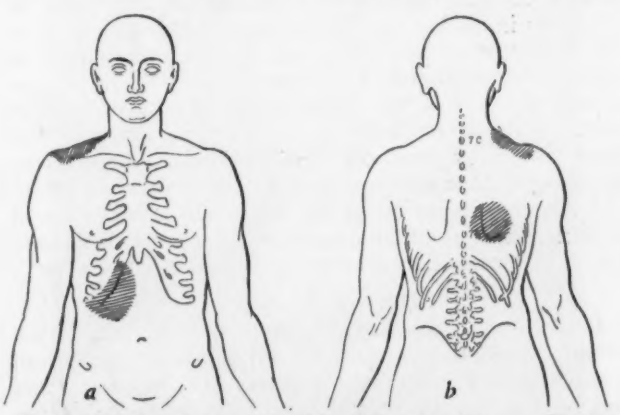

Fig. 7.—Location of pain produced by cholecystitis (case 4). The first two attacks of pain originated in shaded areas shown in *b*. During the last attack pain was felt also in the shoulder and anteriorly as indicated in *a*.

ducts or stricture may be responsible for such recurring pain. In other instances such pain may be due to some unexplained rise of intraduodenal pressure, and pain so caused may simulate in every way biliary colic caused by stones.[10] Back pain—interscapular and over the lower

10. Walters, Waltman, and Snell, A. M.: Diseases of the Gallbladder and Bile Ducts. Philadelphia, W. B. Saunders Company, 1940, p. 571.

part of the scapula—is the rule, and the anterior pain is usually located just below the right costal margin.

(*c*) Diseases of the Extrahepatic Bile Ducts: Pain originating in the hepatic, cystic or common bile duct exhibits the same general characteristics as are noted in cholecystic disease. Calculus in the duct may produce colicky pain through the right upper quadrant of the abdomen with reference to the right lower scapular region. Inadequacy of ductal emptying caused by stricture, débris at the ampulla or neoplastic invasion of the lumen of the duct at times causes pain in the region just mentioned, but as a rule this is much less severe than that due to calculus. Inflammatory disease of the duct which spreads its infectious metabolites to tissues surrounding the ducts or abscesses in that region produce a deep-seated pain in the upper right quadrant over the lower ribs, which spreads frequently from there either around the lower part of the thorax to the back or directly through to the back. With this there is a great deal of tenderness and soreness over the upper right quadrant of the abdomen.

(*d*) Diseases of the Liver: Pathologic processes which involve the liver diffusely, such as hepatitis or cirrhosis, seldom cause severe pain. There is frequently the complaint, however, of an ache over the region of the liver, and this may be felt equally in the back or over the right hypochondrium. Pain in diseases of the liver seems to be mainly determined either by the extent or rapidity of the stretching of the capsule or by the involvement of contiguous tissue such as the diaphragm and peritoneum. Abscesses in or around the liver are the most common cause of severe pain. If regions supplied by the phrenic nerve are involved, reference of pain into the neck or shoulder, usually on the right side, occurs. Invasion of the peripheral portion of the diaphragm or a spread laterally or downward may cause extension of pain over the cutaneous branches of the lower thoracic group of nerves, this pain then being felt over the hypochondrium, the infrascapular region and even as far downward as the right lumbar region. The pain may be sharp and sticking and be intensified by respiration. At other times it is described as a dull, deep-seated soreness. It is usually limited to the right side. Accurate localization of abscesses involving the liver, tissues contiguous to it or for that matter any other of the intraperitoneal or retroperitoneal tissues is frequently possible by means of careful study of the origin of the pain and its reference. With direct invasion of spinal nerves guarding these tissues by products of inflammation, their corresponding cutaneous counterparts often protest loudly and thus by deduction of the segmental distribution of such nerves it is often possible to place the diagnostic finger of localization accurately on the abscess area.

COMMENT AND SUMMARY

It has been suggested that back pain as one of the manifestations of gastrointestinal disease can result from a summation of impulses originating in visceral walls and referred to the back along the sympathetic nerves which carry such impulses to the spinal cord.

We believe that the unilateral shifts of pain arising because of penetrating lesions involving these tracts can, and probably often do, travel to the cord along branches of the spinal nerves. We believe that this is a slightly different type of pain from that usually caused by impulses arising within visceral walls, being more acute, more localizable and better limited to definite segmental distributions. In the case of inflammatory disease—and occasionally of erosive neoplastic disease—involving retroperitoneal tissues, such as acute pancreatitis, back pain is an important symptom. Lesions in this region could involve both spinal nerves and those using sympathetic routes. In such lesions pain is deep seated, frequently severe and fairly well localized. A characteristic feature of this pain and one which is of great diagnostic importance is that patients who have such lesions are usually found to lean forward to relieve their pain. There is still another way in which back pain can be caused by disease originating in the tracts under discussion. Malignant lesions originating there may metastasize to the spinal column. In such instances the pain is usually boring, deeply located, bilaterally felt and constant. In most instances it is well to remember that back pain as one of the manifestations of a disease of the digestive or accessory digestive organs is a symptom which should be considered with great care, because as a rule it indicates that the lesion causing it is a complicated one.

It is always well to suspect disease arising in the gastrointestinal or accessory gastrointestinal tract of patients complaining of dyspepsia as one of the symptoms associated with other back pain.

Clinical Notes, Suggestions and New Instruments

POSTERIOR DISLOCATION OF THE STERNAL END OF THE CLAVICLE

D. P. Greenlee, M.D., Pittsburgh

It is generally recognized that vital soft tissue injury in connection with fractures or dislocations is often of more importance than the treatment of the fracture or dislocation itself. Emphasis has been placed on injuries to the brain in connection with fractures of the spine, on injuries to the lung in connection with rib fractures and on injuries to the bladder, urethra and bowel in connection with fractures of the pelvis. The relative frequency of such injuries deserves this emphasis. Retrosternal dislocation of the clavicle is so rare that little has ever been written about it. However, the fact that such dislocation may occur with encroachment on certain vital structures at the base of the neck warrants this case report.

REPORT OF CASE

R. R., a youth aged 17 years, who was admitted to St. Francis Hospital, Pittsburgh, on Dec. 11, 1938 and discharged on Dec. 16, 1938, was forcibly struck on the right shoulder from the side and rear while playing football on the afternoon of admission. At the time of the injury his muscles were relaxed, since he thought the play had been completed. Following the injury he experienced pain and tenderness over the inner end of the right collar bone, difficulty in breathing and pain on swallowing.

The difficulty in breathing was aggravated by walking, which caused a slight crowing type of breathing, and it was practically impossible to breathe with the head erect. Flexion of the chin on the chest seemed to give him the greatest relief. When put to bed he sat in the upright position with one or more pillows under the head to flex the chin on the chest.

Aside from this complaint the patient was unusually robust and healthy. Routine laboratory examination showed nothing of note. The x-ray examination of the right shoulder girdle with special attention to the medial portion of the clavicle showed an upward posterior and medial displacement of the proximal end of the clavicle to the extent of about 2 cm. There was one small fragment that was apparently broken off the superior medial corner of the clavicle. There was also a slight indentation of the right lateral margin of the trachea with a slight displacement toward the left side, indicating an encroachment on the trachea, as shown in the accompanying illustrations.

On December 13 the dislocation of the clavicle was reduced under gas and ether anesthesia. The operative diagnosis was posterior dislocation of the sternal end of the right clavicle. Open reduction of the posterior dislocation of the sternal end of the right clavicle and application of a plaster shoulder spica were done. An attempt was made to reduce the dislocation by the closed method. This was unsatisfactory, and open reduction was then done. An incision was made, extending from the upper end of the sternum to about the middle of the right clavicle, and the sternal end of the right clavicle was found to be dislocated posteriorly. It was grasped with bone forceps, and several attempts were made to reduce it, but this was not satisfactory. The right arm was then grasped and backward and upward traction made on it by the intern and forward traction made on the sternal end of the right clavicle with bone forceps. Reduction was then satisfactory. Nothing was used to produce fixation at the sternoclavicular joint. The wound was closed without drainage, and a plaster shoulder spica was applied.

The patient's postoperative course was uneventful, and a check x-ray examination showed a satisfactory reduction of the dislocation. The cast was removed five weeks postoperatively. The patient has engaged in vigorous athletics since operation and has had no symptoms referable to the right sternoclavicular joint.

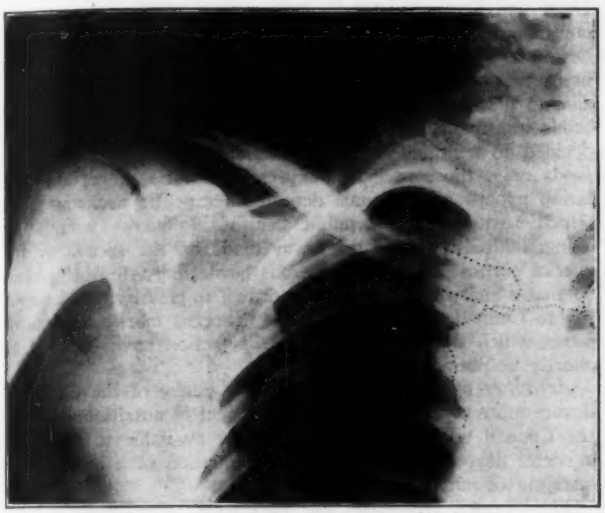

Fig. 1.—Anteroposterior view showing upward and medial displacement of the medial end of the right clavicle.

HISTORICAL REVIEW

In 1922 Schlegal [1] reported a case of retrosternal dislocation of the clavicle and mentioned that 20 cases had been reported in the literature, including his own case. Since then several additional cases have been reported (Brown,[2] Tavernier,[3] Niessen,[4] 2 cases, Wehner,[5] Prat [6] and Goñi Moreno [7]).

Von Stapelmohr [8] mentions that Cooper as early as 1830 reported such a case having pressure symptoms, in which treatment was carried out by resecting the sternal head. Von Stapelmohr [8] also mentions that Guerin in 1841 stated that all clavicular dislocations may be congenital and that he had seen the retrosternal type in an infant. According to Wehner,[5] Shreiber reported the death of a patient with retrosternal dislocation of the clavicle who died from a laceration of the trachea.

Beckman [9] and Prat [6] each mention a case of double luxation of the clavicle (simultaneous acromioclavicular and sternoclavicular dislocations) in which the sternal end was dislocated posteriorly.

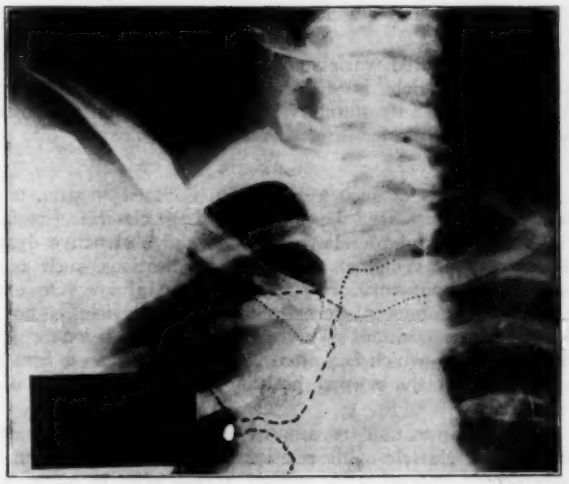

Fig. 2.—Right anteroposterior oblique view showing a shift of the medial end of the right clavicle farther behind the manubrium, indicating a posterior displacement.

The anatomy of the clavicle, particularly the strong ligamentous attachments of both the sternal and acromial ends, makes dislocation relatively uncommon and fracture much more frequent. Strong ligaments attach the sternal end of the clavicle to both the sternum and the first rib. Brown [2] states that 10 per cent of dislocations in the body involve the clavicle and that backward dislocation of the sternal end is the rarest variety. Berkhina [10] states that fracture of the clavicle is twelve times as common as dislocation, and of the two types of dislocations he further states that dislocation of the acromial end is four times as common as dislocation of the sternal end.

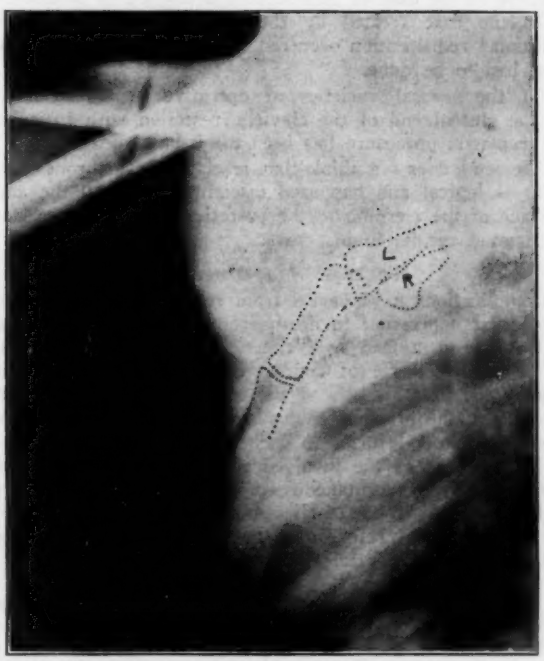

Fig. 3.—Lateral view showing definite complete posterior displacement of the medial end of one clavicle (right).

1. Schlegal, A.: Retrosternal Luxation of Clavicle, München. med. Wchnschr. **69**: 511 (April 7) 1922.
2. Brown, R.: Backward and Inward Dislocation of Sternal End of Clavicle, S. Clin. North America **7**: 1263 (Oct.) 1927.
3. Tavernier: Luxation retro-sternale de la clavicule, Lyon chir. **24**: 694, 1927.
4. Niessen, H.: Zur Behandlung der retrosternalen Luxation der Clavicula, Deutsche Ztschr. f. Chir. **231**: 405, 1931.
5. Wehner: Zur konservation Behandlung der retrosternalen Klavikularluxation, Ztschr. f. orthop. Chir. **55**: 409, 1931.
6. Prat, P. P.: Luxation des deux extrémités de la clavicule; traitement sanglant; résultat éloigné, Mém. Acad. de chir. **62**: 1009 (July 1) 1936.
7. Goñi Moreno, I.: Luxacion traumatica esterno-clavicular (retroesternal), Bol. y trab. de la Soc. de cir. de Buenos Aires **22**: 480 (July 27) 1938.
8. von Stapelmohr, S.: Ueber die habituelle Luxatio sterno-clavicularis und eine neue operative Behandlungsmethode derselben, Acta orthop. Scandinav. **3**: 1, 1932.
9. Beckman, T.: A Case of Simultaneous Luxation of Both Ends of the Clavicle, Acta chir. Scandinav. **56**: 156, 1923.
10. Berkhina, F. O.: Traumatic Dislocations of Clavicle, Ortop. i travmatol. **9**: 11, 1935.

Sternal dislocations may be presternal, suprasternal or retrosternal, and of these varieties the presternal is the most common and the retrosternal the rarest. Rotolo [11] in reporting a case of suprasternal dislocation of the clavicle mentions that Morel Labbee feels that the suprasternal variety of dislocation is simply a variation of the retrosternal variey. This seems logical, as the suprasternal variety is posterior to the sternocleidomastoid muscle.

ETIOLOGY

In the acquired variety of dislocation the mechanism by which the clavicle is dislocated posteriorly is either by a direct blow over its sternal end or by a force on the posterior aspect of the shoulder directed forward and inward.

DIAGNOSIS

The diagnosis of such a dislocation is based on pain, tenderness and swelling near the inner end of the clavicle. Frequently the neck is flexed to relieve the pain and obstructive dyspnea. There may be symptoms of other complications, such as subcutaneous emphysema or brachial plexus injury. On examination the prominent sternal end of the clavicle is not felt in its normal position. There may be a depression or a soft tissue swelling which can often be felt rather than a firm bony prominence at the normal position of the sternal end of the clavicle.

X-ray examination reveals a displacement of the sternal end of the clavicle with relationship to the manubrium, and stereoscopic, lateral and oblique views help in determining whether the displacement is anterior or posterior.

TREATMENT

The treatment carried out has been far from standardized, owing undoubtedly to the scarcity of cases seen by any one man. Some of the cases, such as 1 of the cases reported by Niessen,[4] have been of several weeks' standing before any correction has been attempted. Methods of treatment have varied from the conservative closed method mentioned in the case of Hockner and Schulze reported by Schlegal [1] and also in 1 of Niessen's [4] cases, to radical resection of the entire clavicle in the case of Sauerbruch mentioned by Niessen.[4]

In the case treated by the closed method mentioned by Niessen [4] redislocation occurred in two weeks and open operation had to be done.

Of the several varieties of operative procedure, resection of the sternal end of the clavicle, resection with fusion or an arthroplastic procedure has been the usual type.

Niessen [4] does not think that resection or arthrodesis of the joint is logical and has used fascial repair from the anterior surface of the sternum to the posterior surface of the clavicle, with good results in his cases.

SEQUELAE AND COMPLICATIONS

Complications have varied from relatively mild dyspnea and substernal oppression to death from laceration of the trachea in the case mentioned by Wehner.[5] The structures most likely to be involved are, of course, those in anatomic proximity, namely the great vessels at the root of the neck, the trachea, the pleura, the brachial plexus and the esophagus. Symptoms likely to follow injuries to such structures are swelling, pain and tenderness of the involved region, shock, dyspnea of the obstructive type, subcutaneous emphysema, brachial plexus palsy and dysphagia. In one of Niessen's [4] cases, which was untreated for a few months before open operation, there was a residual brachial plexus palsy following operative treatment.

SUMMARY AND CONCLUSIONS

1. A case of retrosternal dislocation of the clavicle was seen.

2. The association of symptoms resulting from proximity of the retrodisplaced clavicle to the trachea and esophagus was pronounced.

3. A good result was obtained without using any means of internal fixation following open reduction.

4. Early reduction of such dislocations, usually by the open method, is the logical method to alleviate any complications and prevent any untoward sequelae.

11. Rotolo, G.: Contributo alla cura cruenta delle lussazione sterno-clavicolare, Chir. d. org. di movimento **17**: 218 (Aug.) 1932.

Council on Foods and Nutrition

ANNUAL MEETING OF THE COUNCIL ON FOODS AND NUTRITION, 1944

The annual meeting of the Council on Foods and Nutrition was held at the Association headquarters on February 11 and was attended by the following members:

Dr. George R. Cowgill
Dr. C. A. Elvehjem
Dr. Morris Fishbein
Dr. Philip C. Jeans
Mr. Culver S. Ladd
Dr. Howard B. Lewis
Dr. J. S. McLester, Chairman
Dr. Irvine McQuarrie
Dr. Tom D. Spies
Dr. Russell M. Wilder
Dr. George K. Anderson, Secretary

In addition to members of the headquarters personnel there were present Dr. E. M. Nelson of the Food and Drug Administration and Dr. Donald A. Wallace, secretary of the Council on Dental Therapeutics of the American Dental Association.

Drs. McLester and Lewis were reelected chairman and vice chairman respectively. Among the topics which were discussed at the meeting, the following items may be of interest to physicians, manufacturers and others:

Scope of the Council.—The enactment of the Federal Food, Drug and Cosmetic Act in 1938 with provisions for adequate enforcement caused much of the effort which the Council had been exerting in maintaining high standards of production and marketing of foods to be superseded. Some time ago the decision to discontinue close interest in the staple general purpose foods was made, and this was announced at that time. It was decided to continue with the consideration of special purpose foods only, those prepared expressly for use of certain population groups or for some definite therapeutic use, and others which because of their public health significance would merit Council attention. Decision was made on the special or nonspecial purpose status of numerous borderline types of products, so that a sharp line can now be drawn to classify foods according to Council definition. All the concerns marketing accepted foods which will be affected by this action have been or will shortly be notified.

Activities of the Council.—It is the desire of the Council to devote more of its energies to the subject of nutrition. Further, the Council wishes to make its advice available to any of the agencies devoting their efforts to promotion of a better understanding of nutrition.

The Council recognizes the nutritional educational value of proper food advertising and still maintains its interest in the advertising of all types of foods. In particular the educational advertising of those organizations representing the cooperative efforts of the various basic food industries is considered to serve a very useful purpose in familiarizing food consumers with the nutritional merits of the various foods. Use of the Council seal will continue to be extended to this type of food advertising found acceptable.

Occasion was taken to deplore the objectionable state that has been reached in the radio advertising of the many proprietary brands of multivitamin preparations. It was felt desirable that some sort of control be exerted over the statements which are made, but at present no adequate way in which the Council can exert a restraining influence presents itself.

Mixed Vitamin Therapy.—The earlier action of this Council and the Council on Pharmacy and Chemistry in reporting on the uses of vitamins in mixtures and the composition of these mixtures was briefly reviewed. It was felt that the steps taken so far in guiding the use of vitamins were logical and desirable but that one further development needs to be completed before the problem of multivitamin preparations can be considered to be dealt with effectively. This final question entails the selection of generic names for the standard mixed vitamin preparations. Once names have been determined on, products having such nomenclature can be considered with a view to acceptance by the Council on Pharmacy and Chemistry. It is anticipated that with the acceptance of one such product, followed by others, a desirable uniformity of vitamin mixtures will be attained which will facilitate their use by the medical profession as standard reliable therapeutic compounds. (Since this discussion, a contributing step has been taken by the U. S. P. with designation of Hexavitamin and Triasyn B as the official names

respectively for a vitamin preparation containing the six commonly used vitamins with their sources indicated where appropriate and for a preparation containing the three vitamins of the B complex now recognized to be of value in human nutrition. Already one or more brands bearing these names have been submitted to the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies.)

Vitamins in Milk.—The Council considered a report concerned with the question of addition of vitamin A to winter milk, which it is recognized may show definitely lowered content of this vitamin during the winter months in the absence of suitable feeding methods. Suitable levels of this vitamin could be secured by the addition of vitamin A concentrates, but the problems of assay control in maintaining reasonably accurate levels would be considerable, as would other difficulties which can be anticipated. In view of lack of public health need for this vitamin at present, such fortification does not appear justified. As an alternative the use of improved feeding will produce milk of 2,500 or more units to the quart. It was decided that the Council should give the agricultural and dairy groups interested in improving dairy feeding all possible encouragement.

For some time now the principle of fortifying fresh milk with the minimum daily requirements of the vitamins and minerals has been advocated by certain commercial groups. One such product has been submitted to the Council for its consideration. It is felt that from several points of view such additions are undesirable. The only vitamin addition to milk which meets with Council approval is that of vitamin D. The Council authorized preparation of a report which would express its opinion concerning multifortification of milk.

Revision of Food Charts.—The pamphlet "Food Charts," which was prepared in 1942 as part of a Scientific Exhibit sponsored by this Council and the Food and Nutrition Board of the National Research Council, has had wide distribution and usefulness. Since the time of its first preparation more recent analytic data and federal enrichment regulations have made changes in some of the food values necessary. Recommendations for the changes required were made to the Council and were adopted. It was decided to have a revised edition printed as soon as possible.

Vitamin Analysis for Council Accepted Special Purpose Foods.—As in the past, the Council will continue to require vitamin assays on accepted foods for which vitamin claims are made. In addition, information on the content of those vitamins and minerals which are considered to be present in appreciable amounts in a food, particularly the processed special purpose infant foods, will be required. This is primarily for the purpose of determining the effectiveness of the processing methods in preserving the nutritional value of the food. From this information the rating of the food in regard to its contribution of protective elements to the diet can be determined from the standards enumerated on page 16 of the Council's book "Accepted Foods."

Nutritional Value of Wheat Germ.—It is the opinion of the Council that a great many erroneous ideas are held concerning the nutritional value of wheat germ. A clearer understanding of the benefits which can be expected from use of this food substance as well as its limitations would be desirable. With this purpose in mind the Council voted to have a report on this subject prepared for publication.

Status of Food Enrichment Program.—At present the enrichment of white flour by millers is on a voluntary basis, and cooperation of about 80 per cent has been secured. Unfortunately the cheaper flours are not enriched, and it is these which are consumed principally by the low income groups and in sections of the country where general health is poor. Compulsory enrichment of all white flour would be most desirable, but this requirement does not appear to be imminent.

An order of the War Food Administration of January 1943 required that all bakers' white bread be enriched to a standard comparable to what bread would contain in thiamine, niacin, riboflavin and iron if enriched flour was used and conforming to the proposed standard of the Food and Drug Administration of May 1943. An extension of this order to include bakers' rolls will become effective May 1, 1944.

The Council heard a report of the extent to which bakers' white bread is now being enriched in compliance with government order as shown by limited sampling surveys. In view of this report the Council passed a resolution directed to the governmental agencies charged with development and enforcement of the enrichment program urging extension of the educational and sampling campaigns with a view to obtaining more satisfactory compliance.

Recommendation for voluntary enrichment of cornmeal and corn grits has been made by the Food and Nutrition Board of the National Research Council and differential price levels set between these enriched and nonenriched corn products. So far, however, very little progress in enriching this grain food has been made, because cooperation from the corn millers has been slow in forthcoming. The general shortage of corn contributes to this delay.

Rice is another food product claiming attention for enrichment. Although its general use is not considerable, in certain areas in the South it constitutes a significant part of the diet. Enrichment of the milled rice would seem worth while, and steps to develop standards of enrichment are being taken by those interested in extending this practice.

Advertising of Special Purpose Foods.—The Council adopted the policy that advertising and promotional claims for accepted special purpose foods shall be limited to the special uses for which the food is designed.

Vitamin Content of Citrus and Tomato Juices.—In continuance of its investigation of the values for vitamin C in canned citrus and tomato juices, the Council was informed of some recent studies in this field. The vitamin content of tomato juice produced in different sections of the country was found to vary a great deal. Loss in canning is appreciable in tomato juice but is very low in the citrus juices. Under storage conditions considerable vitamin loss was found to occur over several months' time. Discussion of the vitamin C content of these juices has been carried on for some time by the Council in the hope that a standard for vitamin content could be set for determining acceptability of these canned juices to the Council. It was decided that because of the rather wide variation of values found in studies made so far and with other investigations still in progress no standard could be adopted at present. In the meantime, improvement in the processing of these juices is to be anticipated.

Nutrition in Industry.—The Council heard a very comprehensive report from the Cooperative Committee on Nutrition in Industry of this Council and the Council on Industrial Health.

This report dealt with the present status of the development of programs for dealing with the problem of nutrition in industry. Enumeration was made of the groups concerning themselves with these questions and of the considerable material which has been prepared for guidance of the persons faced with the tasks of maintaining adequate nutrition in industries.

It was stated that no satisfactory answer can be given at present on the evaluation of the use of vitamin and mineral preparations in industry. The consensus was against their indiscriminate use. Pending publication of reports of scientific studies now in progress on this problem, no further statement can be made.

The Council adopted a resolution expressing its approval of the cooperative efforts being made for improvement of industrial nutrition and policies advocated for securing this improvement. It was decided that this resolution should be published.

Labeling on Cereal Packages.—With the increasing knowledge of the nutritional content of cereal products and of foods in general, these values are being stated on the food containers. To facilitate an understanding of this information by the general public the Food and Drug Administration requires a statement of the proportion of the minimum daily requirement supplied in a specified quantity. A further statement covering vitamin or mineral content usually accompanies this, expressing the content of these nutrients in any of several units of measure and in any of several specific quantities. As a result there is complete lack of uniformity, and comparison of nutritional value by those scientifically interested is made very difficult.

The Council recommends that to improve the labeling of foods from the scientific point of view the vitamin and mineral content should be stated on the label in milligrams or international units (for vitamins A and D) per hundred grams with caloric content for the same amount.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JUNE 10, 1944

STATUS OF THE PREMEDICAL STUDENT

Under Medicine and the War in this issue of The Journal appears an official statement by the Directing Board of the Procurement and Assignment Service relative to the present status of the effort to secure a continuous supply of physicians. The condition seems to have reached a stalemate. Apparently the responsibility for action lies now with the Director of the Selective Service System, General Hershey. Several high officials of our government have indicated their complete sympathy with the necessity for maintaining continuity of medical education on a high standard. Apparently, however, the Secretary of War, Henry L. Stimson, and the Secretary of the Navy, James Forrestal, are not sympathetic to this need. They have said in a joint communication that the proposal to place premedical and predental students on an inactive status in the enlisted reserve corps so that they may continue their studies would provide immunity from military service for five or more years to a selected group of young men. They suggest, moreover, that the essential in the selection would be the ability of the parents to finance the education, together with the ability of the student to complete the premedical or predental courses and thereafter to qualify for entrance into approved medical or dental colleges.

Apparently the Secretary of War and the Secretary of the Navy oppose granting deferment to premedical students, notwithstanding that failure to do so will lower tremendously the number of graduates in medicine and dentistry in the years 1948 and 1949. The opposition is based on the grounds that the armed forces need young men of intelligence with the proper physical qualifications and that the immediate needs of the war for their services ought not to yield to the prospective use of these young men as doctors at a later date. They support this contention with the argument that many doctors now in the military service will be released by 1948.

An alternative suggestion has been that the Army agree to supply qualified premedical students by selecting from young men now in the armed forces those who had previously been engaged in a course of study in the premedical years and who had already completed at least a year of military service. This would, of course, involve selection of medical students by the Army, rather than by the medical schools. It would involve picking out young men from remote areas like the Aleutians, North Africa and the South Pacific and transporting them back home.

Up to now, government officials have apparently comprehended the need for maintaining continuous medical education of a high standard in the United States. Evidently the pressures on them have caused them to abandon this point of view and to gamble on the future of health in this country. The available statistics indicate that persistence in the policy now prevailing will mean disastrous conditions in the years to come. About 3,500 doctors die each year in the United States. If the armed forces are to take 3,330 out of 6,440 in each medical class, leaving the balance of 3,110 to be filled by women and physically defective men, the situation five years from now will be hazardous. There will be an actual deficit of physicians coming into the profession each year.

The statement that men will be released from the armed forces by that time sufficient to compensate for the deficit in new graduates shows a complete lack of comprehension of the needs of medical service. Where will our hospitals secure interns and residents? Where will the specialist branches in medicine secure the men who will be willing to undergo three to five years of additional training to qualify? Who will take care of the veterans in the greatly expanded medical care program of the Veterans Administration? Who will supply the needs of our allies and, particularly, the people of the liberated countries, where medical schools have been closed and physicians taken as prisoners to take care of the laborers from their own countries deported into Germany? What about the great program of extension of advanced medical education to our neighbors in South America? What about the tremendous needs of China for modern medical aid, which is so strongly emphasized by all of the leaders of our government? At a time when the whole world is confronted with a need for well trained physicians as never before, American officialdom is apparently willing to cut off the supply at its very source.

By June, young men now engaged in premedical education will begin to be inducted into the service. Letters pour into the headquarters office of the American Medical Association from leaders in education, from physicians and from citizens everywhere urging that everything possible be done to halt this folly.

The situation has been complicated by the fact that a committee representing the Council of the Association of American Medical Colleges and another representing the American Dental Association have agreed with

the director of the Selective Service System that the taking of young men from the armed forces after they have completed at least a year of military service will be a satisfactory solution to the problem. From this agreement the Directing Board of the Procurement and Assignment Service, the Council on Medical Education and Hospitals and many leaders in medical education strongly dissent. The statement of the Directing Board appears on page 434 in this issue. The Council on Medical Education and Hospitals is convinced that the plan cannot insure an adequate supply of qualified medical students. The argument has been offered that the Selective Service System was able to carry out a similar program successfully for the supplying of coal miners and copper miners. Any one familiar with the requirements in the field of premedical education will realize that there can be no analogy between these two situations. The continuing production of physicians of a high standard of education should have precedence because of the fundamental demand for such services at all times by the armed forces and because the needs of our civilian population now and in the future cannot be met by the education of men who are physically substandard and of women. It is, to say the least, uneconomical to spend the time, the effort and the money necessary to put a boy through a premedical course, a medical course and an internship when his physical condition is such as to indicate a lessened life expectancy and the possibility of invalidism in the future. Ten years of service to the people at the end of his career will be of far more value from every possible point of view than ten years at the beginning.

Certainly this problem is one to which the House of Delegates of the American Medical Association should give most careful and serious consideration at the forthcoming session in Chicago. Certainly it is of sufficient importance to demand that it be taken, if necessary, directly to the Congress of the United States and to the President.

COUNCIL ON RHEUMATIC FEVER

Following several preliminary sessions, a conference on rheumatic fever sponsored by the American Heart Association was held in New York City in January 1944, with some thirty delegates representing various medical, governmental and social organizations. This conference adopted unanimously two resolutions:

1. Because of the magnitude and importance of the rheumatic fever problem, this conference is strongly in favor of the extension of public programs, supported by federal, state and local funds, for the study, prevention and treatment of this disease. Moreover, we believe it essential that additional funds be secured from private sources for the purpose of special studies to increase basic knowledge of the disease, for professional education and for increasing public awareness of the problem.

2. In order to accomplish the purposes mentioned above, this conference recommends that a Council on Rheumatic Fever be formed under the leadership of the American Heart Association, and that this council shall include representatives of interested organizations.

Following this conference, the board of directors of the American Heart Association met in February and proceeded to form a Council on Rheumatic Fever. In the formation of this council invitations are being sent to the American Public Health Association, American Medical Association, American College of Physicians, American Academy of Pediatrics and the American Rheumatism Association. A national nursing organization is to be invited and also a national agency representing social workers. It is understood that governmental agencies will be kept informed of the progress of the effort but that these agencies would prefer not to have actual representation on the council.

Plans are now under way to raise funds for organization purposes and for the support of a moderate amount of work during the first year. In the meantime the Children's Bureau is expanding the federal program for rheumatic fever on the grounds that it is a crippling disease; the definition of a child, for purposes of the Children's Bureau, is any one under 21 years of age. It is understood that the Children's Bureau's present budget for the rheumatic fever program approximates $250,000 annually and that the average amount given to each state that participates is $20,000. The Children's Bureau, it is reported, proposes to request a gradual increase in the total sum allotted to about $400,000 for several years, then $500,000 and eventually $1,000,000 annually.

According to Dr. H. M. Marvin, chairman of the executive committee of the American Heart Association, delegates who participated in the January conference felt that the study, treatment and possible prevention of rheumatic fever and rheumatic heart disease constitute a problem far too large for private funds. They felt that rheumatic fever is just as truly a community responsibility as is tuberculosis. The council felt that its activities could be adequately supported by nongovernmental funds but also that the council would encourage and advise the use of local, state and federal funds for expanding important activities in relation to rheumatic fever.

The situation now in embryo is obviously a reflection of much of the thinking that now prevails in the United States regarding the future of health activities and the control of disease. Every physician is eager to aid to the utmost in achieving the objectives sought. However, there would seem to be need for a clear definition by the House of Delegates of the American Medical Association of the policies to be followed in determining the extent of control and assistance to be supplied by federal, state and local governments in meeting such problems.

CHILD SPACING, YOUTH AND FETAL MORTALITY

In 1925 the extensive investigations of Woodbury [1] on causes of infant mortality emphasized the opinion that a short interval between deliveries is important in increasing the fetal mortality rate. Woodbury's results were based on the statistical analysis of 8,196 births. The rate of infant mortality, expressed per thousand, was 146.7 for groups of births in which the interval since the preceding delivery was shorter than a year, as compared with 98.6 when the birth spacing was two years, 86.5 and 84.9 when the intervals were three and four or more years. Thus there appeared to be an inverse correlation between the rate of infant mortality and the length of interval since the preceding birth.

Statistical analysis of the child spacing factor as related to the rate of infant mortality has now been repeated by Eastman [2] in 5,150 births. The results for the one year interval group, expressed in actual figures, do not differ much from those found by Woodbury. Thus the incidence of neonatal deaths in this group was seven to ten times as high as that of groups with longer intervals between births. However, this result does not warrant the conclusion that the high fetal mortality rate is a consequence of the short birth spacing. In fact, any unselected series of pregnancies which terminate within a period of a year after a previous delivery will necessarily include a high number of premature deliveries and hence is bound to be associated with a high incidence of stillbirths and neonatal mortality. Moreover, as compared with the other groups, the one year interval group was shown to include many more mothers of the Negro race, whose fetal mortality is much higher than that of the white race. These factors had not been evaluated in the study by Woodbury, who properly eliminated other possible causes such as order of birth, age of mother and economic condition of father.

In the series with birth intervals longer than a year, Eastman's figures are different from those of Woodbury. The infant mortality rate was found to be 1.5 per cent in the two years interval, 2.2 per cent in the three years interval and 2.6 per cent in the four years interval group. The higher incidence of toxemia of pregnancy found in the groups with longer birth spacing correlated well and probably accounted for this trend in neonatal mortality. As patients included in the longer interval groups are bound to be older than those included in the groups with shorter birth intervals, the higher incidence of fetal mortality and toxemia of pregnancy in the former may reasonably be related to the age of the mother.

As pointed out by Eastman and stressed by Dieckmann and Danforth in the discussion of Eastman's paper, youth and not child spacing seems to afford the most effective protection against both fetal and maternal mortality. In the series studied by Woodbury the death rates for infants whose mothers were under 18 years of age and for those whose mothers were over 40 years of age were much higher than those of intermediate groups. The lowest death rate was that of the group between 25 and 30 years of age.

TREATMENT OF PARALYSIS AGITANS AFTER ENCEPHALITIS

Many attempts have been made recently to control or abolish the rhythmic tremors so commonly found as a late manifestation of encephalitis. If the tremor is not reduced by drug treatment, as is so often the case, a physician is justified in seeking relief for his patient, particularly if young, by surgical means. Because the nervous pathways carrying the impulses giving rise to rhythmic muscular movements, however, are only partly known, a final decision at the present time regarding the exact connecting links between the muscles and the brain suitable for interruption in an attempt to abolish tremor cannot be given. Complete agreement between neurologists, neurosurgeons and neurophysiologists has not been reached, although considerable work is being done on this problem by various investigators, among them Klemme.[1]

Klemme has traced by serial sections of the brain and spinal cord a fiber tract from the premotor cortex, a part of the brain lying anterior to the motor cortex and identified by Brodmann on the cytoarchitectural map of the human cortex as area 6, through the internal capsule, midbrain, pons and medulla to the spinal cord. It is the faulty functional interrelation of the impulses passing downward over this pathway with those traveling between the basal ganglions and the spinal cord, both carrying motor impulses to a "common path cell complex," that Klemme believes gives rise to "an asynchronicity" of effort, the tremor. For normal behavior, he reports, the basal ganglions and the premotor cortex must be in balance. When lesions occur in the ganglions, particularly the substantia nigra and the globus pallidus, as following encephalitis, an asynchronicity of impulses results in tremor. By removing the normal premotor cortex, the operation advised by Klemme, a second lesion is made, the first being in the basal ganglions caused by the disease, and this "abolishes the asynchronicity and hence the tremor at rest." [2]

As the fibers from area 6, as do those from a less well defined area in front of it, area 8, descend in the pyramidal tract with the motor corticospinal system

1. Woodbury, R. M.: Infant Mortality and Its Causes, Baltimore, Williams & Wilkins Company, 1926; Causal Factors in Infant Mortality: A Statistical Study Based on Investigations in Eight Cities, Children's Bureau Publication, No. 142, 1925, Government Printing Office, Washington, D. C.

2. Eastman, N. J.: The Effect of the Interval Between Births on Maternal and Fetal Outlook, Am. J. Obst. & Gynec. **47**: 445 (April) 1944.

1. Klemme, R. M.: Surgical Treatment of Dystonia, with Report of 100 Cases, A. Research Nev. & Ment. Dis., Proc. (1940) **21**: 596, 1942.

2. Klemme, R. M.: The Neural Mechanism of Paralysis Agitans, Arch. Neurol. & Psychiat. **50**: 367 (Sept.) 1943.

from area 4, they are indistinguishable from the others. Section of the whole corticospinal tract at any level will abolish tremor, as shown by Bucy, Putnam, Meyers and others. Putnam has also accomplished the same result by cutting the pyramidal tract in the spinal cord. The advantage of the spinal cord operation, as pointed out by Putnam in his discussion of Klemme's paper (p. 368), is that tissue is not sacrificed. Klemme, moreover, in doing the cortical extirpation removes tissue more radically than Putnam, who takes away only 2 to 5 Gm., solely from area 6. Fulton,[3] on the other hand, states that "an operation restricted to area 4 alone is the operation of choice for advanced Parkinson tremor." Whatever area is removed or wherever the tract is severed, one may agree with Putnam's statement "Concerning the clinical facts there can be only agreement." The disagreement concerns the exact nature of tremor and the nervous pathways involved. Until the mechanism is understood, no single operation can be advocated to relieve this distressing symptom.

Most investigators think that a rhythmic circuit is involved in alternating tremor but do not seem to agree with Klemme that the corticospinal tract descending through the pyramids is one arc. As section of the posterior roots or the ascending columns does not abolish tremor, one cannot visualize an afferent segment to the reflex. Putnam notes, moreover, that no rhythmic discharge has ever been elicited from the cortex by stimulation giving rise to tremor. In spite of the facts as noted by Putnam, Klemme may have at least a partial answer to a complex problem. Before accepting any surgical procedure as one sufficiently standardized, or even beyond the experimental stage, to justify recommending to a patient, further work must be reported, particularly clinicopathologic in type, and this can be assembled only slowly and with utmost care.

The whole subject up to 1940 is summarized in the papers by Bucy, Klemme, Meyers and Putnam.[4] Only Klemme fails to report in detail his case histories. More recent work in animal experimentation by Mettler [5] and by Kennard [6] shows that movements of the choreoathetotic type and tremors of the intention type may be produced by destruction of the appropriate basal ganglions and that the functional loss so demonstrated is influenced by the interruptions of connections with cortical areas 6, 8 and 4, and the thalamus and hypothalamus. The lesions produced in the animal, however, do not fully duplicate the rigidity and tremor seen in clinical postencephalitic parkinsonism.

One final word of caution should be uttered: Removal of cortical areas of the brain may be followed by epilepsy and, if a patient is already the subject of a convulsive tendency, an operation, such as Klemme advocated, might result in an even more distressing condition than the patient's present plight.

3. Fulton, J. F.: Physiology of the Nervous System, ed. 2, New York, Oxford University Press, 1943, p. 457.
4. The Diseases of the Basal Ganglia, A. Research Nerv. & Ment. Dis., Proc., Baltimore, Williams & Wilkins Company, 1942.
5. Mettler, F. A.: Extensive Unilateral Cerebral Removals in the Primate: Physiological Effects and Resultant Degeneration, J. Comp. Neurol. **79**: 185 (Oct.) 1943.
6. Kennard, M. A.: Experimental Analysis of the Functions of the Basal Ganglia in Monkeys and Chimpanzees, J. Neurophysiol. **7**: 127 (March) 1944.

Current Comment

PHYSIOLOGIC NORMALITY

The range of human physiologic and psychologic normality has always been difficult to determine. The need for accurate definition of the mental and physical normal is nowhere more acute than among physicians. The physiologist Ivy [1] has recently discussed this subject. "A function of the body is statistically normal or usual," he says, "when its value falls within the central 68.26 per cent of the values found in a homogeneous group (same species, race, age, sex, etc.) of persons without complaints and structural defects that are indicative of disturbed function." The 68 per cent value is chosen because persons with high and low values of function and without the symptoms of disease are to be regarded with suspicion. They should not be called abnormal, however, unless other functions and margins of safety can actually be shown to be interfered with or reduced. The complexity of the subject is staggering. The statistical and physiologic and clinical concepts of normality of aging and growth, Ivy says, are easily confused. Indeed the growth of a single person may be physiologically normal, though statistically abnormal. Slow or rapid growth revealed by the statistical method may be suspected of being physiologically abnormal but cannot be considered abnormal until a cause is found. The same is true of aging. Here, in the borderlines of physiology and medicine, is an illustration of the necessity that the practice of medicine continue as partially art rather than pure science.

PNEUMOCOCCUS TYPES AND POLYVALENT ANTISERUM

Seventy-five types of pneumococci have now been identified.[1] A recent report [2] on cross reactions among pneumococcus types has established a number of groupings which appear to be of antigenic importance. Fourteen groups, each including from three to ten pneumococcus types, have been established. All groups, Eddy points out, must be regarded as tentative until it is determined that the types used as immunogens stimulate the production of antibodies sufficient to meet the minimum requirements for antiserums. If the use of pneumococcus antiserums should ever develop importance like that before the sulfonamides came into use, the establishment of this type of grouping will prove most useful.

1. Ivy, A. C.: What Is Normal or Normality? Quarterly Bull. Northwestern Univ. Med. School, Chicago **18**: 22 (Spring Quarter) 1944.
1. Eddy, Bernice E.: Nomenclature of Pneumococcic Types, Pub. Health Rep. **59**: 449 (April 7) 1944.
2. Eddy, Bernice E.: Cross Relations Between the Several Pneumococcic Types and Their Significance in the Preparation of Polyvalent Antiserum, Pub. Health Rep. **59**: 485 (April 14) 1944.

MEDICINE AND THE WAR

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

A REPORT ON EFFORTS TO MAINTAIN A CONTINUING SUPPLY OF PHYSICIANS

In December 1942 it was agreed by the Surgeons General of the Army and Navy and the directing board of the Procurement and Assignment Service that classes admitted to medical schools for the duration of the war should be made up of the following groups: Army Specialized Training Program students 55 per cent, Navy V-12 students 25 per cent and civilian students 20 per cent, the latter group to be made up of women and men physically disqualified or otherwise ineligible for military service.

The curtailment of the Army Specialized Training Program in April 1944 provided that medical students and premedical students in the Army Specialized Training Program should continue in training but that no more students should be admitted to the program.

It is estimated that the number of premedical students remaining in the Army Specialized Training Program is sufficient to fill only 28 per cent of the places in the classes to be admitted to medical schools in 1945. The Navy will continue to fill 25 to 31 per cent of the places.

The reduction in the Army Specialized Training Program had the effect of increasing the number of places which must be filled by civilian medical students by 27 per cent. This situation gave concern to the directing board of the Procurement and Assignment Service lest it be found impossible to secure an adequate number of properly qualified candidates for medical schools to fill the classes in the future and to keep the supply of doctors constant and adequate.

Early in April Selective Service, after conference with the Inter-Agency Committee on Occupational Deferment, ruled that premedical students acceptable to the armed services, unless accepted for admission and matriculated and entered into actual classroom work in a recognized school of medicine on or before July 1, 1944, will no longer be deferred. The Procurement and Assignment Service wishes to record the following developments which have taken place since that time:

At a joint meeting of the directing board of the Procurement and Assignment Service with the Surgeons General of the Army, Navy and Public Health Service these problems were discussed, and it was mutually agreed that the effect of these two policies on medical education would be dangerous in terms of production of physicians, continued existence of the medical schools and the effects on public health.

On April 12, at the suggestion of the Procurement and Assignment Service, recommendations were made by Mr. Paul V. McNutt, chairman of the War Manpower Commission, to Major General Lewis B. Hershey, director of Selective Service, embodying the objections and apprehensions of the Procurement and Assignment Service to this program.

On April 15 a reply from General Hershey indicated that ". . . No exceptions will be made as respects the date of July 1. We shall, as in the past, give full faith and credit to the certificates of professional colleges as to the status of students matriculated therein and engaged in actual classroom work within the school or under its immediate supervision. . . ."

On April 26 a communication was forwarded by Mr. McNutt to the Secretary of War and to the Secretary of the Navy, urging the armed services to provide some status for a sufficient number of students to fill the entering classes in medical schools.

On April 28 discussions were held by the directing board at one of its regular meetings with representatives of the War Department, and these apprehensions were stated to them and discussed with them.

On May 8 a discussion was held with Mr. James V. Byrnes, director of war mobilization, concerning this whole situation, and it was his opinion that since this matter under the law was entirely in the hands of Selective Service it was not within his province to take any action in this matter.

On May 16 the Secretary of War and the Secretary of Navy jointly advised the chairman of the War Manpower Commission that it seemed to them ". . . that the immediate needs of the war for their [students'] services ought not to yield to the prospective use of them as doctors in 1949 or thereafter, particularly when it is to be expected that the course of the war will by then make it possible to release many doctors at present in the military service. The action of the director of Selective Service in refusing these deferments was, therefore, in accord with the recommendations of the departments, and for them now to put these students into inactive reserve status would, in effect, be to defer them and so nullify the action of the director of Selective Service which we supported. . . ."

This now brings the matter up to date and in the accompanying table is submitted an estimate of what the status of medical classes will be under the program as it now exists.

Estimates of Medical Students for 1945

Total number of places in entering classes		6,440
Army students, 28%	1,790	
Navy students, 25%	1,540	3,330
Balance to be filled by women and by men disqualified for general military service		3,110

Past experience suggests that it should be possible to fill 400 to 500 of these places with women students. This leaves approximately 2,600 places which, under current policies of Selective Service, can be filled only by men who are disqualified for general military service.

It is impossible at this time to predict how many of these places the medical schools will be able to fill without lowering their standards of admission. Less than 10 per cent of present medical students are physically disqualified for military service. The liberalization of deferments for men classified by Selective Service, and the discharge of increasing numbers of men by the Army and Navy, should make it possible to augment somewhat this proportion. Only time will demonstrate whether this situation will improve or deteriorate. No predictions are justified at this time for classes to be admitted in 1946 and thereafter.

At the present time the directing board of the Procurement and Assignment Service feels that it has exhausted all possibilities to secure more satisfactory arrangements to maintain medical enrolment. It presents this statement in order that the medical public may be made aware of the facts. Throughout these communications and conferences the directing board has constantly emphasized to all agencies concerned, in its opinion, the dangers of the situation. It will continue to do so.

DIRECTING BOARD, PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS, VETERINARIANS, SANITARY ENGINEERS AND NURSES.

ARMY

INVESTIGATION OF JAPANESE MEDICAL DEPOT AT AN EVACUATED AIR STRIP IN NEW GUINEA

Captain Earl W. Schafer
Flight Surgeon
MEDICAL CORPS, ARMY OF THE UNITED STATES

By means of a small liaison plane I was able to land shortly after the Japs had been driven to the hills. There were several dispensaries and large quantities of medical supplies left behind; also quantities of food.

The place had a deathlike silence and odor. When a coconut fell or a bird called one would jump, expecting a Jap sniper to rise out of the underbrush.

Most medical supplies were packed in excelsior or partitioned paper cartons inside wooden packing cases. One noticed a predominance of glass containers—glass bottles and various size vials (some 1 cc., others 500 cc.). There were packing cases full of 500 cc. vials of intravenous saline and Ringer's solution. These vials had sealed glass tips on each end. No other intravenous equipment was found. X-ray plates, cans of plaster, Petri dishes, large and small test tubes, crucibles, antiseptics with both Japanese and English names and directions on the boxes but made in Japan. There were large quantities of surgical dressings: small paper wrapped dressings and cloth bound bandages much like our Carlisle dressing. Most of them were dyed either pink or green. There were some which looked like sheets but when unfolded were a foot wide and 6 to 3 feet long and were white. Ether was put up in 50 cc. vials in small rectangular wooden boxes along with a small file. There were large canvas instrument cases about the size of an overnight bag and small nestled baskets. Several large porcelain urinals and 2 to 3 gallon clay jars colored a dull pink were found. Quantities of atabrine and insect repellent and rubber condoms were there.

Although we thought the Japs in this area were in a starving condition, nevertheless we found stacks of burlap sacks full of rice and other cereals; also there were tins of biscuit and some canned fish.

There were rather queer looking metal splints—some very much like our own Thomas splint. Rubber surgical gloves were scattered around. In another area there were piles of clothing, among which we found thick rubber gauntlet gloves with a mitten hand, gas masks, protective ointment and impregnated clothing. There were many pairs of new knee length suntan pants, fatigue hats and suits, rubber galoshes, boxes of rubber heels and leather shoes.

Several partly screened in pens were found which may have contained native pigs; at least the tracks were present.

Considering the probability that the enemy carried their surgical instruments and other more valuable equipment with them and the fact that we found such quantities and varieties of drugs and dressings, I am convinced that the Japanese medical service in the field is far more than just satisfactory.

AIR TRANSPORT MOVES WAR CASUALTIES TO THE UNITED STATES

The War Department recently announced that about 700 war casualties were moved by the Air Forces Air Transport Command to hospitals within the United States during the seven day period ended April 26. The ATC will now fly all war casualties moved by air within the United States. Rapid expansion of air evacuation in this country has been stimulated by the crowded condition of the railroads and the fact that fewer medical personnel are required. Pilots fly at altitudes below 9,000 feet, although fixed and portable oxygen systems are standard equipment. Twelve new C-47s are currently assigned to this domestic operation. Members of the Medical Air Evacuation Transport Squadrons assigned to Air Transport Command are based at Wilmington, Del., and Memphis, Tenn. The usual medical "crew" on a domestic run is one flight nurse and one medical staff sergeant.

The combat air forces outside the United States, the foreign wings of the Air Transport Command and various air commands in the United States have done experimental work on this problem. In the last calendar year 173,527 sick and wounded patients were evacuated by American military aircraft throughout the world. For the total of 3,260 sick and wounded returned aboard ATC planes from war theaters to this country the hops ranged from three hours to thirteen hours of continuous flying.

The air evacuation system now makes it possible to fly a casualty from China across India, Africa and the Atlantic to the West Coast of the United States if medical necessity demands. The command has lost only 1 patient as a result of air travel. Patients for the transocean hauls are selected by flight surgeons. The patients' general fitness for air travel is the deciding factor. Present air evacuation plans call for all transocean planes of the four motored C-54 type to be equipped with the new type litters accommodating 24 patients in a plane. Loading a plane takes six to eight minutes. The new litter equipment does not interfere with the utility of a plane for other purposes; the C-54s make the flight from the United States to war theaters carrying priority cargo, mail and passengers and return with their mercy shipments.

DR. WARREN F. DRAPER ASSIGNED TO ARMY

The War Department announced recently that Dr. Warren F. Draper, Deputy Surgeon General, U. S. Public Health Service, has been assigned to duty with the Army in the grade of Brigadier General. His duties in the Army will be concerned with public health problems of occupied countries. Dr. Draper is a graduate of Harvard Medical School and has been in the U. S. Public Health Service since 1910. During the first world war he was assigned to the Army and had charge of extracantonment sanitation in the Norfolk, Va., area. Since then he has served as Assistant Surgeon General in charge of States Relation Division of the Public Health Service, and for three years he served as state health officer of Virginia. In 1939 he was named assistant to the Surgeon General under Dr. Thomas Parran, and recently he became Deputy Surgeon General.

NEW ZEALAND ARMY HOSPITAL

The New Zealand Army Hospital, where sick and wounded American servicemen are treated and rehabilitated, is the largest hospital in the South Pacific area. Situated in a healthful, temperate climate, the hospital was built and furnished by the New Zealand government and equipped with U. S. medical supplies. The staff, consisting of physicians and nurses from Yale University School of Medicine and School of Nursing, was activated July 15, 1942 at Camp Edwards, Massachusetts.

The program for mental and physical rehabilitation of patients includes work in shops, a photographic dark room, a gymnasium, and an athletic field operated in conjunction with the Red Cross. The Red Cross recreation building has games, movies, library and an orchestra organized by enlisted men on duty at the hospital. New Zealand civilian entertainers perform for patients. The hospital's rehabilitation program has been so successful that few patients have had to be evacuated to the United States for further treatment, and many of them have been returned to duty.

MEDICAL ADMINISTRATIVE CORPS OFFICERS

The thirty-first class of the Camp Barkeley Medical Administrative Corps Officer Candidate School graduated on May 17. Brig. Gen. Roy C. Heflebower is the school commandant.

ARMY PERSONAL

Major John H. Grindlay, formerly on the staff of the Mayo Clinic, is now on the staff of a hospital at an extreme advanced base in the Northeastern India Frontier. Mr. Keith R. Berkner is field director of the American Red Cross in that area.

MISCELLANEOUS

WARTIME GRADUATE MEDICAL MEETINGS

Additional subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

At the Fitzsimons General Hospital, Denver: Morning session, Reconditioning the Soldier Patient, Col. Augustus Thorndike; Convalescent Training Program in the Army Air Forces, Major Donald Covalt; Certain Aspects of the Problem of Hepatitis, Dr. Cecil J. Watson; Peptic Ulcer, Dr. Walter L. Palmer. Afternoon session, Factors to Be Taken into Consideration in Making Diagnosis of Causes of Low Back Pain, Dr. Paul B. Magnuson; Treatment of Ruptured Intervertebral Disks, Dr. J. Albert Key; Classification of the Various Forms of Colitis and Their Management, Dr. J. Arnold Bargen; Amputations: Postoperative Care and Fitting of the Prosthesis, Dr. Atha Thomas. Evening session, Ophthalmoscopy and the Diagnosis of Human Illness, Dr. Arthur J. Bedell, June 22.

At Colorado General Hospital, Denver: First day, morning session, Chronic Pneumonitis: Its Clinical Course and Treatment, Lieut. Col. John B. Grow; Gunshot Wounds of the Lungs, Major Brian Blades; Plastic Surgery in War Injuries, Capt. Radford C. Tanzer; Host-Parasite Relationships in Tropical Medicine, Dr. William C. Black. Afternoon session, Some Clinical Characteristics of Fungous Diseases, Dr. Robert A. Stewart; The Diagnosis of Coccidioidomycosis, Lieut. Col. George J. Kastlin; The Absence of Toxic Effects and Reasons for Failure with Penicillin Therapy, Lieut. Col. Frank B. Queen. Dinner meeting, Hotel Shirley-Savoy, American Medicine, Past and Future, Dr. Lewis J. Moorman, June 23. Second day, morning session, Treatment of Addison's Disease by the Implantation Method, Dr. C. F. Kemper; Functional Disturbances of the Digestive Tract, Dr. Walter L. Palmer; The Symptomatology and Pathology of Aspiration Pneumonia, Dr. Ernest E. Irons; The Emphasis on Psychosomatic, Dr. Ralph A. Kinsella. Afternoon session, Review of Clinical Experiences with Rheumatic Fever in Approximately 300 Cases: (*a*) Rheumatic Fever: Its Recognition in Typical and Atypical Cases, with a Note on the Clinical Significance of the Disease, Major Frank P. Foster; (*b*) The Value of the Electrocardiogram in the Diagnosis of Rheumatic Fever and Significant Findings During the Course of the Disease, Capt. Francis M. Kernan; (*c*) Treatment of Rheumatic Fever with a Note on Recent Advances, Major George C. McEachern; The Use of Penicillin and Intravenous Salicylates in Treatment of Acute Rheumatic Fever, Capt. Howard C. Coggeshall; Highlights in Geriatrics, Capt. Edward L. Bortz, June 24.

At U. S. Naval Hospital, Santa Margarita Ranch, Oceanside, Calif.: Symposium on rehabilitation: General Surgery, Comdr. E. L. Calhoun (MC), U.S.N.R.; Orthopedics, Comdr. J. D. MacPherson (MC), U.S.N.R.; Psychiatry, Lieut. Comdr. J. H. Nichols (MC), U.S.N.R.; Otolaryngology, Capt. H. P. Schenck (MC), U.S.N.R., June 21.

VETERANS OF TWO WARS SET UP NATIONAL ORGANIZATION

A national organization of veterans of two major wars popularly known as the "Retreads," but officially incorporated under the name of "Veterans of 1917 and 1941," was recently established by Comdr. Alfred M. Glickman of Camp Thomas, Davisville, R. I. Charter No. 1 has been issued to the Camp Thomas chapter. The list of seventy-five charter members includes the names of captains, commanders and other high ranking officers, but no distinction of rate or rank appears, as all members enjoy the same rights and privileges within the "Retreads." The purpose of the organization is to "maintain and enjoy the camradeship of its members; to uphold and defend the Constitution of the United States of America; to preserve memories and incidents of the two world wars fought to uphold democracy; to perpetuate the memory of its members who made the supreme sacrifice; to foster true patriotism; to maintain and extend the institutions of American freedom; to preserve and defend the United States from all her enemies whomsoever, and to consecrate the efforts of its members to mutual helpfulness and service of their country." The organization is instituting a movement to have created a suitable insigne to be worn by veterans of both world wars. Dr. Glickman graduated from Tufts College Medical School, Boston, in 1921, and in this war entered the Navy April 2, 1941.

MERCHANT VESSELS CARRY TRAINED MEDICAL REPRESENTATIVE

The War Shipping Administration recently announced a goal of an adequately trained medical representative aboard every merchant cargo vessel by the end of 1944. Junior assistant purser-pharmacist's mates are being graduated from the U. S. Maritime Service Hospital Corps School at Sheepshead Bay, N. Y., as rapidly as possible and then being sent to sea immediately. The course consists of a five weeks indoctrination period, a twelve week course at the Corps School, followed by a five week period in the functions of a purser, and concludes with a month of practical training in a marine hospital. More than 1,200 have been graduated from the school since the first class in December 1942, and WSA officials estimate that one out of every four merchant ships has a medical representative aboard.

In the Hospital Corps School, seamen receive instruction in anatomy and physiology, nursing and preventive medicine, including the giving of inoculations, ship's hygiene and sanitation, clinical laboratory work, pharmacy, and advanced first aid. This course is followed by one month's practical experience and training in a marine or other approved hospital.

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service:

(Continuation of list in THE JOURNAL, May 27, page 285)

CONNECTICUT

Waterbury Hospital, Waterbury. Capacity, 372; admissions, 8,144. Miss Aida E. Creer, R.N., Superintendent (2 interns, October 1).

MASSACHUSETTS

House of Mercy Hospital, Pittsfield. Capacity, 235; admissions, 4,446. Dr. R. J. Marcotte, Director (4 interns, July 1)

MINNESOTA

Bethesda Hospital, St. Paul. Capacity, 180; admissions, 6,083. Rev. L. B. Benson, Superintendent (interns).

NEBRASKA

Lincoln General Hospital, Lincoln. Capacity, 213; admissions, 4,574. Mr. Robert B. Witham, Administrator (4 interns).

NEW JERSEY

Newark Memorial Hospital, Newark. Capacity, 130; admissions, 2,663. Miss Anna C. M. Nelson, R.N., Superintendent (2 interns).

NEW YORK

Binghamton City Hospital, Binghamton. Capacity, 559; admissions, 10,475. Mr. Jerome F. Pack, Superintendent (4 interns, June; 8 interns, October).

Lincoln Hospital, New York City. Capacity, 469; admissions, 9,521. Dr. Randolph A. Wyman, Superintendent (assistant resident in pediatrics, temporary appointment, July 1 to Sept. 30, 1944).

OHIO

Aultman Hospital, Canton. Capacity, 180; admissions, 6,332. Mr. James W. Stephan, Director (interns, October 1).

Jewish Hospital, Cincinnati. Capacity, 300; admissions, 8,072. Mr. Van C. Adams, Superintendent (intern, October 1).

Miami Valley Hospital, Dayton. Capacity, 445; admissions, 12,484. Mr. O. K. Fike, Director (interns, July 1, 1945).

TENNESSEE

St. Thomas Hospital, Nashville. Capacity, 225; admissions, 7,053. Sister Lydia, R.N., Superintendent (2 interns, October 1).

VIRGINIA

Alexandria Hospital, Alexandria. Capacity, 130; admissions, 4,474. Mr. R. G. Whitton, Administrator (intern, resident).

WISCONSIN

Luther Hospital, Eau Claire. Capacity, 176; admissions, 4,377. Mr. N. E. Hanshus, Superintendent (intern).

ORGANIZATION SECTION

OFFICIAL NOTES

THE CHICAGO SESSION

Radio Broadcasts

The following radio broadcasts have been arranged in connection with the annual session of the American Medical Association to be held in Chicago June 12-16. Details and information not available for inclusion in this announcement will be found in the *Daily Bulletin* of the meeting and in the daily radio columns in local newspapers:

Saturday, June 10, 3: 30-4 p. m.
Doctors at War, "Frontiers of Medicine." Speaker, Morris Fishbein.

Sunday, June 11, 12: 45-1 p. m., Columbia Broadcasting System
"War and the Medical Profession." James E. Paullin, Atlanta, Ga., President of the American Medical Association.

Tuesday, June 13, 12: 45-1 p. m., Blue Network.
"Psychiatric Study of Successful Soldiers." Capt. Jack G. Sheps, Royal Canadian Army Medical Corps, Toronto.

Tuesday, June 13, 4: 45-5 p. m., WCFL
"Rheumatic Fever in the Army Air Forces." Col. W. Paul Holbrook, M. C., A. U. S., Air Surgeon's Office.

Tuesday, June 13, 4: 45-5: 00 p. m., WCFL
"Convalescent Training Program in Army Air Forces Hospitals." Lieut. Col. Howard A. Rusk, M. C., A. U. S., Air Surgeon's Office.

Wednesday, June 14, 9: 45-10 a. m., WJJD
"Psychiatric Selection of Men for the Armed Forces." Raymond W. Waggoner, Ann Arbor, Mich., and, if available, Col. William Menninger, M. C., A. U. S., interviewed by W. W. Bauer.

Friday, June 16, 6: 30-6: 45 p. m., N. B. C.
"Doctors and the Nation's Health." Herman L. Kretschmer, President of the American Medical Association, interviewed by W. W. Bauer.

Saturday, June 17
Doctors at War, "Mechanized Dandruff." Speaker, Brig. Gen. James S. Simmons, Chief, Preventive Medicine Service, War Department, Washington, D. C.

All time is Central War Time.

Conferences on Rheumatic Fever

A feature of the Scientific Exhibit will be informal daily clinical conferences on rheumatic fever sponsored by the Section on Pediatrics in cooperation with the rheumatic fever committees of the American Academy of Pediatrics and the American Heart Association. Special emphasis will be placed on the diagnosis and management of a case. Among the clinicians who have volunteered their services for these conferences are Drs. T. Duckett Jones, Boston; Alexander T. Martin, New York; Morse J. Shapiro, Minneapolis; Stanley Gibson, Chicago; May G. Wilson, New York; Leo M. Taran, Brooklyn; Bernard J. Walsh, Washington, D. C.; Oswald F. Hedley, Washington, D. C.; Robert R. Struthers, Montreal, and Robert L. Jackson, Iowa City. A room has been made available for informal discussion on the exhibit floor of the Palmer House adjacent to the rheumatic fever exhibit booth of the Metropolitan Life Insurance Company.

Rush Alumni Luncheon

There will be a luncheon of the Rush Alumni Association at 12: 15 p. m. on Wednesday, June 14, in the Century Room of the LaSalle Hotel. Because of OPA regulations, tickets should be bought at the registration desk not later than Tuesday afternoon, June 13.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 1100 has been reported to the Senate, a bill to provide for the promotion of officers on the retired list of the Army after specified years of service on active duty. Among other things, this bill provides that officers of the Medical Administrative Corps who have been or may be retired as such in the grade of second lieutenant or first lieutenant shall be promoted to the respective grades of first lieutenant and captain immediately upon completing, respectively, five years and ten years of service. S. 1808 has passed the Senate, authorizing the temporary appointment as officers in the Army of the United States of members of the Army Nurse Corps, female persons having the necessary qualifications for appointment in such corps, female dietetic or physical therapy personnel of the Medical Department of the Army (exclusive of students and apprentices), and female persons having the necessary qualifications for appointment in such department as female dietetic or physical therapy personnel. S. 1809 has passed the Senate, a bill to remove the limitation on the right to command of officers of the Dental Corps of the Army which limits such officers to command in that corps. S. 1944 has passed the Senate, authorizing an annual appropriation of $500,000 to provide books either in raised characters, on sound-reproduction records, or in any other form for the use of adult blind residents of the United States. A companion bill, H. R. 4729, has been favorably reported to the House. H. J. Res. 241 has been reported to the House by the Committee on Foreign Affairs, requesting the President to approach the governments of all opium producing countries throughout the world, urging that they take immediate steps to limit and control the growth of the opium poppy and the production of its derivatives to the amount actually required for strictly medicinal and scientific purposes. H. J. Res. 271 has been approved by the President, appropriating $6,700,000 for emergency obstetric and pediatric care for the wives and infants of enlisted men for the remainder of the present fiscal year. H. R. 1506 has been approved by the Senate Committee on Military Affairs, after substituting the language of S. 1690, a bill introduced by Senator Johnson of Colorado to amend the Pay Readjustment Act of 1942 so as to permit the counting of services in the Medical Reserve Corps for pay purposes. The conferees have reached an agreement on H. R. 4278, a bill providing, among other things, for the carrying out of agricultural conservation and related agricultural programs. A Senate amendment to the bill provided that none of the money made available in the Department of Agriculture Appropriation Act, 1944, for loans, grants and rural rehabilitation may be used in the promotion or aid of any program of medical care which prevents the patient from having the services of any practitioner of his own choice so long as state laws are complied with. The conferees added to the foregoing Senate amendment an exception that the amendment would not be applicable to the promotion or aid of a program of medical care where a majority of the participants within the program group elect to confine their choice of practitioners to a list of available licensed practitioners selected by them. The action of the conferees in this particular matter has been approved by the House. H. R. 4881 has been reported to the House, a bill to bring isonipecaine within the purview of federal narcotic laws. H. R. 4899 has passed the House, a bill providing appropriations for the Department of Labor, Federal Security Agency and related independent agencies for the fiscal year 1945. Among other things, this bill provides an appropriation of $42,800,000 for a continuation of the E. M. I. C. program of which not more than 2 per cent

may be allotted to the states for administrative expenses on the basis of need as determined by the Chief of the Children's Bureau. The bill proposes no change in the method by which the obstetric and pediatric services rendered to the wives and infants of servicemen are to be paid for.

Bills Introduced.—S. 1911, introduced by Senator Wagner of New York, for himself and Senator Wheeler, Montana, and H. R. 4805, introduced by Representative Crosser, Ohio, are companion bills proposing, among other things, to amend the Railroad Retirement Act and the Railroad Unemployment Insurance Act. These bills provide for cash sickness and maternity benefits for employees who are beneficiaries of the acts proposed to be amended. S. 1946, introduced by Senator George of Georgia for himself and Senator Thomas of Utah, Senator Hill of Alabama, Senator Jackson of Indiana, Senator Aiken of Vermont, Senator LaFollette of Wisconsin and Senator Ellender of Louisiana, a bill to provide vocational training and retraining programs for the occupational adjustment and readjustment of veterans returning from military service, workers demobilized from war production plants, for other youth and for adults, that individuals and the nation may attain economic stability and security, and to extend further the program of vocational education. H. R. 4909, introduced by Representative Randolph, West Virginia, provides for health programs for government employees.

STATE MEDICAL LEGISLATION

Louisiana

Bills Introduced.—S. 95 proposes to create an anatomic board to be composed of the dean, the head of the department of anatomy and one additional member of the department of anatomy of Tulane University School of Medicine, Louisiana State University School of Medicine and Loyola University School of Dentistry. This board is to be empowered to promulgate rules and regulations for the collection, storage and distribution of dead human bodies for anatomic purposes. S. 34 proposes to make it a misdemeanor for any person infected with syphilis who, possessing the means to secure treatment therefor, fails to submit to treatment by a licensed physician. It is likewise to be a misdemeanor for any person infected with syphilis to reject treatment thereof by a licensed physician when it is offered free of cost. H. 459 proposes to permit any resident of the state possessing a degree of Bachelor of Science from an accredited college to enter the Louisiana State University Medical School as a student. H. 460 proposes that any resident of the state who has graduated from the Louisiana State University Medical School or Tulane University Medical School shall be entitled to serve his or her internship at the New Orleans Charity Hospital. H. 461 proposes that native Louisiana physicians be given preference in the appointment of dean of the Louisiana State University Medical School.

WOMAN'S AUXILIARY

Arkansas

The Arkansas auxiliary is making a special effort to collect facts about the pioneer doctors of the state, and as an observance of Doctor's Day each auxiliary member has been asked to bring the typewritten history of one pioneer doctor. The pioneer period of Arkansas medical history ends in 1881, the date of the first register of physicians and surgeons in the state.

Indiana

Fifty members attended the dessert meeting of the Allen County Medical Auxiliary recently at the home of Mrs. Ernest R. Carlo. Mrs. George Turner reviewed "Burma Surgeon."

In order to stimulate interest and attendance, the Vanderburgh County auxiliary gives $5 in war stamps as a contest prize at each meeting.

Louisiana

The Shreveport Medical Auxiliary paid special tribute to Doctor's Day with a fine exhibit on display in a prominent show window in the business section. This exhibit was quite successful from an educational standpoint, depicting "The Progress of Medical Science." Among the items of special interest displayed were the relics of prehistoric medicine, also books, pictures and instruments used throughout the intervening years. Mrs. J. M. Gorton of Shreveport was Doctor's Day chairman.

Minnesota

The Minnesota auxiliary has placed 182 *Hygeia* subscriptions in institutions.

Kandiyohi-Swift-Meeker counties have reorganized as an auxiliary, and a new auxiliary was formed in Waseca County.

Mrs. Eben Carey, national president, was entertained at a tea in Minneapolis February 4, at which time she urged each doctor's wife to appoint herself a committee of one to carry the facts of the Murray-Wagner-Dingell bill to groups and clubs.

Ohio

The Ross County auxiliary met in January in Chillicothe. Mrs. Walter S. Barret gave a talk on "The Golden Age."

Oklahoma

A formal meeting of the Pittsburg auxiliary was held at the home of Mrs. L. S. Williams, the president. The tea was given in honor of the wives of the medical officers stationed at the prisoners of war camp and the naval ammunition depot. War work has been the chief concern of the auxiliary members—knitting, surgical dressings and nurses' aide work. Mrs. Willour, chairman of the Pittsburg County tuberculosis seal sales, raised $1,489 in the recent campaign.

Members of the Oklahoma County auxiliary have been working on surgical dressings for the University Hospital, also making students gowns and wrappers. They have purchased three $100 bonds and three $25 bonds.

South Carolina

The Spartanburg County auxiliary recently had a luncheon in the Cleveland Hotel with thirty-seven members present. Mrs. J. E. Orr, state president of the auxiliary, was the speaker. The wives of the Camp Croft physicians were guests.

Texas

The Falls County auxiliary conducted a Town Hall program at Marlin on the subject of socialized medicine recently. The meeting was well attended, and following it a number of Marlin residents wrote to their congressmen urging them to oppose the Wagner-Murray-Dingell bill.

Much war work is being done by the Texas auxiliaries. The El Paso County auxiliary made Red Cross dressings, the Kerr-Kendall-Gillespie-Bandera auxiliary purchased two $25 war bonds, the Grayson County auxiliary is helping with the collection of blood plasma, and the Jefferson County auxiliary gave funds to the Beaumont and Port Arthur U. S. O. centers. The Kerr-Kendall-Gillespie-Bandera auxiliaries did much for the sale of tuberculosis seals, having sold $1,200 worth.

Dr. Ruby K. Daniel gave an interesting travelogue before the Dallas County auxiliary recently, describing her experience in China with the Rockefeller Foundation.

Virginia

Dr. Morrison Hutcheson was the speaker at a recent meeting of the Richmond auxiliary. He discussed "Pending Medical Legislation." At a later meeting Dr. Hutcheson spoke on "Prediction of Fifty Years from Today."

The Northampton-Accomac auxiliary held its regular quarterly meeting recently at the home of Mrs. Rooker White of Keller.

West Virginia

Dr. Ray M. Bobbitt of Huntington was the speaker at a luncheon meeting of the Cabell County auxiliary held at the Frederick Hotel recently. He discussed the Wagner-Murray-Dingell bill. The auxiliary endorsed the proposed plan for a full time city-county health unit.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Penicillin Plant for Berkeley.—A $600,000 plant for producing penicillin will be constructed adjoining the Cutter Laboratories in Berkeley, the result of a contract granted by the Defense Plant Corporation. Ground has been broken for the new building. It was stated that sixty scientists will be on the staff, once the plant is in operation.

Appointments to State Medical Board.—Dr. Anthony B. Diepenbrock, San Francisco, was recently appointed a member of the state board of medical examiners to succeed Dr. Alvin E. Cerf, San Francisco, whose term expired. Dr. Joe Zeiler, Los Angeles, was named a member of the board for a four year term, succeeding Dr. Hugo M. Kersten, Los Angeles.

Von Urban Acquitted of Practicing Medicine Without a License.—Rudolf von Urban, "adviser on sexual problems," was recently acquitted of charges that he had practiced medicine without a license, newspapers reported. Von Urban had been brought into court on a complaint of an investigator for the state board of medical examiners, the state contending that he had been trained as a physician in his native Vienna, had practiced medicine there for many years and therefore was acting as a doctor when he set out to advise Monterey County women. In his defense, von Urban is said to have defined "sexology" as the "science of occurrence in the soul which teaches people to understand sex instincts."

COLORADO

Rheumatic Fever Now Reportable.—At a meeting of the state board of health on April 4 rheumatic fever was made a reportable disease in Colorado. The action was taken because it is generally recognized that the disease is a serious public health problem, because of the increased interest in the disease among medical and lay groups throughout the country and because most reports indicate that Colorado morbidity and mortality rates from rheumatic fever are among the highest in the United States.

DISTRICT OF COLUMBIA

Latin American Physicians in This Country.—Dr. Catts Pressoir, professor of psychology in the Lycée Pétion at Port-au-Prince, Haiti, is in Washington as the guest of the Department of State. Also a physician, Dr. Pressoir will make a tour of various medical centers throughout the country. Dr. José Zozaya, Mexico City, director of the Institute of Public Health and Tropical Diseases of Mexico, was also a guest of the Department of State and plans a tour of various places in the United States. Dr. Zozaya is engaged in organizing a central medical library for the National Academy of Medicine of Mexico. According to an announcement from the Department of State, Dr. Zozaya will extend invitations to physicians who wish to specialize in tropical medicine to pursue their investigations at the institute of tropical medicine, of which he is director. The institute consists of the central institute at Mexico City with a substation at Chiapas, one at Guerrero and one, now under construction, at Boca del Río in Vera Cruz. Dr. Pedro P. Nogueira Rivero, in charge of the Marianao Health Unit, Cuba, is a visitor in this country under the auspices of the U. S. Department of State.

FLORIDA

Dr. Paul Placed in Charge of Malaria Control.—Dr. John Harland Paul, for three years in charge of malaria control in Haiti, has been appointed director of the bureau of malaria control of the state board of health.

Conviction for Narcotic Violation.—On April 12 Dr. Emory A. Carter, De Land, was convicted in the U. S. District Court at Jacksonville of violation of title 18, section 72, of the U. S. Code "for the reason that he wrote narcotic prescriptions in the names of purported patients, presenting them himself for filling and obtaining the drugs to satisfy his own addiction." Dr. Carter was sentenced to imprisonment for a term of two years, according to the federal bureau of narcotics.

ILLINOIS

New Headquarters for Venereal Disease Center.—The Lake County Free Treatment Center for Venereal Disease, located in the Lake County General Hospital, Waukegan, was moved on May 25 to new quarters at 20 South Utica Street, Waukegan. The old location of the center was in the outlying area, whereas the new location is in the downtown district. The clinic is set up under health district number 2 of the state department of public health. It is supported by state and federal funds in quarters furnished by the Lake County Board of Supervisors. Dr. Donald B. Douglas and Dr. Kenneth C. Beck, both of Waukegan, are in charge.

Chicago

Two Rush Classes Have Reunion Luncheon.—The Rush Medical College classes '03 and '04 will celebrate a joint fortieth reunion at a luncheon to be given for them at the Presbyterian Hospital on Tuesday, June 13. Members of these two reunion classes will be the luncheon guests of the Rush Medical College and Presbyterian Hospital. The reason for the inclusion of two classes is that there was no A. M. A. meeting in 1943.

Cancer Forum.—The Chicago Cancer Committee sponsored a forum for the public on "Facts About Cancer" in the theater of the museum in Jackson Park, May 23. Dr. Eben J. Carey, dean of Marquette University School of Medicine, Milwaukee, and curator of medical science at the museum, was moderator at the forum and speakers included:

Dr. Ludvig Hektoen, chairman of the cancer committee and executive director, National Advisory Cancer Council.
Dr. Bowman C. Crowell, associate director, American College of Surgeons.
Dr. Josiah J. Moore, Treasurer of the American Medical Association.
Dr. Herbert E. Schmitz, professor and head of the department of obstetrics and gynecology, Loyola University School of Medicine.
Dr. Alexander Brunschwig, professor of surgery and roentgenology, University of Chicago School of Medicine.

Chicago Alumni Meeting—Publication of Year Book.—The Alumni Association of the University of Chicago School of Medicine will hold a meeting on June 14 at the Albert Merritt Billings Hospital. Dr. Charles H. Rammelkamp Jr., on the staff of station hospital number 2, Fort Bragg, North Carolina, who has been associated with Dr. Chester S. Keefer, Boston, will discuss "The Present Status of Penicillin." A reception will follow the meeting at Billings cafeteria. This is the first meeting in a number of years of the alumni association. Coincident with the announcement of the alumni meeting is one concerning the publication of a year book by the senior class of the University of Chicago School of Medicine. The first publication of its kind attempted by the medical school, the book will review the development of the school from the time of the opening of the Billings Hospital in 1927 up to the present period. A section will be devoted to each graduating class and will include class pictures, addresses and current information on other activities. Dr. John V. Prohaska is president of the alumni association, which now has a membership of about 525. The alumni group was officially organized in 1934.

Institute of Medicine Accepts Sponsorship of Service for Chronically Ill.—On May 1 the Institute of Medicine of Chicago accepted the sponsorship for the Central Service for the Chronically Ill, a group organized in 1943. Prior to this action the work of the service had been directed by an administrative committee which included as members Drs. George H. Coleman, James P. Simonds, Charles H. Phifer, Ludvig Hektoen and William F. Petersen, chairman. The service, which has offices at 343 South Dearborn Street, was originally organized:

To survey the facilities now available and determine the nature and extent of the need in the community.
To cooperate with interested and responsible agencies of the community in planning and developing needed facilities, and to provide leadership and educational programs for the public to the end that properly planned projects may be encouraged and carried through to completion.
To provide a central informational service regarding facilities in the community for the care of the chronically ill for the purpose of assisting individuals to obtain care and of offering help to physicians in the selection of appropriate homes, institutions or other services for their patients, both indigent and self supporting.

It stemmed from the health division of the Council of Social Agencies and was financed by the Community Fund. Both of these groups, however, wanted the new service to be operated under the auspices of a medical agency.

Portrait of Howard Ricketts.—A portrait of the late Dr. Howard Taylor Ricketts, who died in Mexico City May 3, 1910 of typhus, will be unveiled in the Archibald Church Library at Northwestern University Medical School, June 11.

The portrait is the gift of Mrs. Howard T. Ricketts and will be presented by Dr. Henry T. Ricketts, son of the late physician. The unveiling will be done by Robert Howard Palmer and Howard James Ricketts, both of whom have been named in honor of their grandfather. Dr. Ludvig Hektoen, after an introduction by Dr. Irving S. Cutter, dean emeritus of Northwestern University Medical School, will deliver the principal address. Dr. Ricketts spent five years on the Evanston campus of Northwestern, three years in the academy and two in the college. After spending his junior and senior years at the University of Nebraska, Lincoln, he graduated there in 1894. He then returned to Northwestern medical school to graduate in 1897. The portrait, executed by Oskar Gross, Chicago, is a commemorative gift to mark the fiftieth year of graduation of the late physician and his wife. Their class at Northwestern is this year celebrating its fiftieth anniversary on the Evanston campus. The medical school is sponsoring the tea to mark the presentation of the portrait as an adjunct to the Evanston observance. The portrait will hang permanently in the Archibald Church Library. A special exhibit of memorabilia depicting the work of Dr. Ricketts, who contracted typhus while carrying on research on the disease, will be on display.

LOUISIANA

University News.—The board of supervisors has made a special appropriation of $36,000 to expand the library of Louisiana State University School of Medicine, New Orleans. These funds will be used in purchasing sets of journals needed by the library.

One Hundred Years of Medicine.—With its May issue the *New Orleans Medical and Surgical Journal* celebrated its 100th anniversary. The issue contains much medical history and opens with a review by Dr. Rudolph Matas on "One Hundred Years of Medical Journalism in Louisiana." The journal has been published continuously since that time with the exception of a few periods. An editorial points out that during the hundred years of the existence of the journal the country has engaged in five major wars, the Mexican, the war between the states, the Spanish-American War and the two world wars. The journal contains a list of the editors from the time of the journal's inception. Dr. Albert E. Fossier, New Orleans, has contributed an article on "The Early History of the New Orleans Medical and Surgical Journal."

MARYLAND

Dr. Steiner Goes to Detroit.—Dr. Starling D. Steiner, Baltimore, has resigned as chief of the division of industrial hygiene of the state department of health to accept a position with the Cadillac division in the General Motor Corporation, Detroit.

MASSACHUSETTS

Changes in Health Personnel.—Dr. James O. Wails, director of the Nashoba Health Unit, Ayer, has been appointed health commissioner of Worcester. Dr. Harry G. Wyer, who was formerly a lieutenant colonel in the U. S. Army and is professor of military medicine at the Boston University School of Medicine, is now health officer of the south metropolitan district of the Massachusetts Department of Public Health.

Report of Psychiatry Clinic.—The Boston Psychoanalytic Institute has published the first annual report of the Psychiatry Clinic opened Oct. 5, 1942 at 82 Marlborough Street, Boston. Of 177 applications, 3 were referred twice during the year. Of the 174 persons, 69 did not follow up the referral or were referred elsewhere, 96 were accepted for consultation or treatment and 9 applications were pending at the end of the first year of operation, October 1943. Of the patients seen at the clinic, more than one third were discharged service men returned to the community from training camps or, more recently, from actual combat areas. About one third of the patients came either because of their reaction to rejection for service on psychiatric grounds or because the approaching induction had stirred up in them emotional problems which up to that time they had been more or less able to handle without outside help. About one sixth of the clinic patients were women who came because they were unable to cope with the enlistment of their sons, husbands, brothers or fiancés. The remaining patients were mostly employees of defense industries. One half of the referred patients belong to the group of so-called civilian war neuroses, for which the clinic was originally intended. The original purpose in creating the clinic was to offer a service to the community in the immediate crisis of the war and thereafter to create a center for research in methods for a short form of treatment (THE JOURNAL, Oct. 31, 1942, p. 707). The report indicates that the first year's operation presages the success of the clinic. While the clinic was to be conducted on a nonprofit basis, patients were treated without charge in some cases. From those for whom a nominal charge was made, about $500 was collected. It is expected that about $400 more will be collected this year. The report mentions an anonymous gift of $6,500 to assist in the maintenance of the clinic. It is interesting to note that the clinic was opened with only the contributions made available by members of the staff. Any one wishing to contribute toward the work of the psychoanalytic clinic should send donations to Dr. Leolia A. Dalrymple, Boston, treasurer. When the patient's condition was found not due to the war or otherwise unsuitable for short treatment, a referral was made to some other community service. Among these conditions were mental diseases which might require hospitalization, mental symptoms due principally to disease or injury of the nervous system and chronic alcoholism.

MICHIGAN

Personal.—Dr. Welsey H. Mast, Petoskey, was named a member of the state council of health to succeed Dr. Oscar D. Stryker, Fremont, his term to end June 30, 1949.——Dr. James A. Olson, Flint, public school medical adviser and director of the Charles Stewart Mott Foundation health center, has resigned, effective April 1, to take a three year fellowship appointment to study ophthalmology at Henry Ford Hospital, Detroit.——Dr. Edwin J. Rennell has resigned as medical superintendent of the Pontiac State Hospital, effective April 15, to become superintendent of the Coldwater State Home and Training School. Dr. Harry C. Dunstone, assistant superintendent of Ypsilanti State Hospital, has been named to succeed Dr. Rennell at Pontiac.

New Diarrhea and Enteritis Service Offered.—The Michigan Department of Health, with the cooperation of the W. K. Kellogg Foundation, now has available a diarrhea and enteritis study group to give assistance to hospitals experiencing active outbreaks of nursery diarrhea. The study group, which has been in training for a year, is in charge of a licensed physician and is made up of two sections, one working in the field and the other in the laboratory. The field section consists of a physician, two graduate nurses and a medical secretary. The laboratory section is composed of two bacteriologists, one virologist, five laboratory assistants and one secretary. Field operations will be limited to Michigan, northern Ohio and northern Indiana. Any hospital experiencing an active outbreak of nursery diarrhea may request the services of the group. The cost of the field operations will be borne by the W. K. Kellogg Foundation and the state department of health.

MINNESOTA

Dr. Hewitt Honored.—On May 31 Dr. Richard M. Hewitt, Rochester, head of the division of publications of the Mayo Clinic, was presented with an honorary achievement award by George Washington University School of Medicine, Washington, D. C., "for achievements in medical journalism." Dr. Hewitt graduated at George Washington twenty years ago. He went to the Mayo Clinic in 1928, after having served since 1925 as assistant editor of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Physician Surrenders License on Abortion Charge.—On March 8 Dr. Orel A. Kibbe, Minneapolis, pleaded guilty in the district court of Hennepin County on the charge of performing an illegal operation and surrendered, in open court, his medical license and basic science certificate with a written request that they be canceled by the Minnesota State Board of Medical Examiners and the Minnesota State Board of Examiners in the Basic Sciences, respectively. His sentence, not to exceed four years in a state penal institution, was suspended on condition that the physician refrain from practicing medicine in any manner. On February 28 Dr. Kibbe was arrested after investigation had disclosed that he had performed a number of abortions for fees ranging from $10 to $35 each. On March 1 he entered a plea of not guilty and was released on cash bail in the sum of $2,000. He later changed his plea to one of guilty.

MISSOURI

State Medical Election.—Dr. Arthur S. Bristow, Princeton, was chosen president-elect of the Missouri State Medical Association at its annual meeting in Kansas City. Dr. Robert Mueller, St. Louis, is acting president during the absence of Lieut. Col. Curtis H. Lohr, M. C., president. Drs. Francis T. H'Doubler, Springfield, and Walter L. Brandon, Poplar Bluff, are vice presidents; Dr. Charles E. Hyndman, St. Louis, is treasurer. Dr. Ralph L. Thompson, St. Louis, is secretary-editor. A feature of the meeting was the unveiling of a portrait

of the late Dr. Andrew W. McAlester. The unveiling was done by his granddaughter following a tribute by his son Dr. Andrew W. McAlester Jr., Kansas City, the outgoing president of the association.

OHIO

Fifty Years in Medicine.—The Columbus Academy of Medicine recently held a dinner to honor twenty-six physicians who have practiced medicine in Columbus for fifty years or more. Dr. Morris Fishbein, Editor of THE JOURNAL, was the principal speaker. Included among the guests of honor were Drs. John A. Bauer, Joseph E. Beery, John Edwin Brown, Arlo Solomon Canright, William H. Cleveland, Dana W. Collison, Myrwood T. Dixon, Edson J. Emerick, Enoch N. Heston, Emma Olavi Jones, Charles F. Junkermann, Florus F. Lawrence, Lee H. Mann, Joseph A. Murphy, James A. Park, Herbert M. Platter, Clarence C. Ross, Charles J. Shephard, Lawrence M. Sifrit, Gustavus A. Sulzer, Sterling B. Taylor, Andrew J. Timbermann, Luther B. Turner, John H. J. Upham, Howard Whitehead and Simon B. Winters.

Report of Cleveland Health Museum.—Dr. Howard Lester Taylor was reelected president of the board of trustees of the Cleveland Health Museum at its recent annual meeting. In a report to the board Dr. Bruno Gebhard, director, stated that because of the rapidly increasing attendance the museum will in the future be open seven days a week. In 1943 the museum was open 332 days with a total attendance of 28,998, of which about one third was in 520 groups, including 56 classes for expectant mothers and fathers under the sponsorship of the local child health association. Groups and classes from 69 schools and colleges utilized the museum. Visual aid material was lent to 36 schools and 31 organizations in greater Cleveland, and exhibit material was lent to 29 organizations outside of Cleveland. It was also stated that the museum had begun work on an industrial health program for greater Cleveland plants, which is now well under way.

TEXAS

Library Building Fund.—The Houston Academy of Medicine has begun the collection of a fund to construct a building to house its medical library. Members of the academy will be solicited first before public contributions are sought.

Dr. Grollman Named Professor at Southwestern Medical College.—Dr. Arthur Grollman, research professor of medicine and associate professor of physiology and pharmacology, Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, N. C., has been appointed professor in the department of experimental medicine at the Southwestern Medical College of the Southwestern Medical Foundation, Dallas. THE JOURNAL, May 27, page 297, erroneously reported that Dr. Grollman was being appointed assistant professor at the college. The appointment will be effective July 1.

WISCONSIN

Personal.—Dr. Ralph B. Quinn was elected mayor of Darlington recently.——Dr. Maurice Rosenzweig, formerly assistant superintendent of Beth Israel Hospital, Boston, is the new superintendent of Mount Sinai Hospital, Milwaukee.

Physician's Memory Honored.—A group of friends have donated a fund to Mount Sinai Hospital, Milwaukee, in memory of the late Dr. Clarence A. Baer, the hospital's first dermatologist. A glass case, displaying Dr. Baer's picture and medals awarded him in the last war, has been hung in the hospital's dermatology room, which bears his name.

Professor Bock Retires at Marquette.—Joseph C. Bock, Ph.D., professor and head of the department of physiologic chemistry, Marquette University School of Medicine, Milwaukee, will retire on July 31 with the title professor emeritus. He will be succeeded by Dr. Armand J. Quick, associate professor of pharmacology at the medical school since 1937. Dr. Bock received his doctor of philosophy degree at Cornell University in 1917. He has been a member of the Marquette faculty since 1918. Dr. Quick, who graduated at Cornell University Medical College, New York, in 1928, has been a member of the Marquette medical school since 1935.

Hearing Rehabilitation Clinic.—On April 5 the Milwaukee Hearing Rehabilitation Clinic opened at the dispensary of the Marquette University School of Medicine under the sponsorship and cooperation of six interested medical and special groups. Recommended by the American Academy of Ophthalmology and Otolaryngology, the clinic has been made possible through the cooperation of the Medical Society of Milwaukee County, the Milwaukee Oto-Ophthalmic Society, the Marquette University School of Medicine, the Milwaukee Society of the Hard of Hearing and the rehabilitation division of the Wisconsin State Board of Vocational Training. Working quarters for the clinic are supplied by Marquette University. The clinic aims to assist hard of hearing persons with medical or rehabilitation problems. After diagnosis the clinic will direct the patient to proper medical or surgical treatment or to rehabilitation through lip reading and hearing aids according to the requirements of the case. According to the *Milwaukee Medical Times*, the clinic will not interfere in any way with the private practice of medicine. It will restrict its activities to examination and evaluation of the hearing problem involved but will not treat any person examined by it or referred to it. If desired, results of the diagnosis will be referred to the patient's physician. A small fee will be charged to those able to pay. For the time being the clinic will be open one afternoon a week.

GENERAL

Honorarium to Dr. Fleming.—Arthur Cremin, New York, recently sent a $1,000 check to *Time* to be forwarded to Dr. Alexander Fleming for his work on penicillin. Mr. Cremin, in the belief that doctors get nothing but praise for their contributions to humanity, wanted to give the $1,000 to Dr. Fleming "to show that the great painkillers of humanity have a few friends with hearts that beat for them."

New Medical Director of Woodmen of the World Hospital.—Dr. Harry P. Thomas has been appointed superintendent of the Woodmen of the World War Memorial Hospital, San Antonio, Texas. He succeeds Dr. Augustus D. Cloyd Sr., medical director of the Woodmen of the World, who had been acting superintendent for five months. The action was approved at a meeting of the board of directors of the association in San Antonio recently.

Trudeau Medal Goes to Dr. James A. Miller.—The Trudeau Medal for meritorious achievement in the prevention and treatment of tuberculosis was awarded during the meeting of the National Tuberculosis Association in Chicago, May 10, to Dr. James Alexander Miller, professor of clinical medicine, Columbia University College of Physicians and Surgeons and director of the tuberculosis clinic, Bellevue Hospital, New York. Dr. Miller was president of the National Tuberculosis Association in 1923.

Pediatric Board Changes Examination Dates.—The American Board of Pediatrics announces that owing to the shortage of hotel space in New York the dates for the fall examinations there have been changed. The amended schedule reads that the written examination for all candidates planning to take the fall oral examinations will be held on Friday September 22. The oral examinations planned for St. Louis will be November 8-9 and New York City December 15-16. Dr. C. Anderson Aldrich, Rochester, Minn., secretary of the board, again announces that group I, which requires that an applicant shall have been specialized in pediatrics for ten years or more, will be abolished on July 1. All applicants, regardless of qualifications, must take both the written and the oral examination.

Educational Director Named for Baruch Committee on Physical Medicine.—Ernest J. Jaqua, LL.D., Eugene, Ore., former president of Scripps College, Claremont, Calif., has been appointed educational director of the Baruch Committee on Physical Medicine. Two committees have been set up, one a scientific advisory committee and the other the committee on war and postwar physical rehabilitation and reconditioning. Members of the scientific advisory committee are:

Dr. Frank H. Krusen, Rochester, Minn., chairman.
Dr. Jaqua, secretary.
Dr. John Stanley Coulter, Chicago.
Dr. John Farquhar Fulton, New Haven, Conn.
Dr. Charles Gordon Heyd, New York.
Dr. Andrew C. Ivy, Chicago.
Chauncey D. Leake, Ph.D., Galveston, Texas.
Dr. Frank R. Ober, Boston.
Dr. Winfred Overholser, Washington, D. C.
Francis O. Schmitt, Ph.D., Cambridge, Mass.
Dr. Ray Lyman Wilbur, Stanford University, Calif., member ex officio.

Members of the committee on war and postwar physical rehabilitation and reconditioning include:

Dr. Krusen, chairman.
Dr. Jaqua, secretary.
Major Walter E. Barton, M. C.
Capt. Charles F. Behrens (MC).
Senior Surgeon Dean A. Clark, U. S. Public Health Service Reserve.
Dr. Charles M. Griffith, Washington.
Capt. Frederick A. Jostes (MC).
Capt. Howard H. Montgomery (MC).
Lieut. Col. Howard A. Rusk, M. C.
Mr. Harold V. Stirling, Washington.
Lieut. Col. Benjamin A. Strickland Jr., M. C.
Col. Augustus Thorndike Jr., M. C.
Dr. William S. Tillett, New York.

Special Society Elections.—Dr. Albert V. Stoesser, Minneapolis, was chosen president of the Northwestern Pediatric Society at its meeting in Minneapolis, April 14. Other officers include Dr. George C. Kimmel Jr., Red Wing, vice president, and Dr. John M. Adams, Minneapolis, secretary-treasurer. The society represents the states of Minnesota, North Dakota, South Dakota and Montana. At the recent meeting the *Journal Lancet* was made the official publication of the society. ——Dr. Melvin N. Newquist, New York, was chosen president-elect of the American Association of Industrial Physicians and Surgeons at the annual meeting of the association in St. Louis, May 11, and Dr. Frederick W. Slobe, Chicago, was inducted into the presidency. Other officers include Drs. Loyal A. Shoudy, Bethlehem, Pa., and Henry S. Brown, Detroit, vice presidents, and Dr. Edward C. Holmblad, Chicago, treasurer and managing director.——During the thirteenth annual meeting of the Harvey Cushing Society in New York, May 17-18, Dr. Franc D. Ingraham, Boston, was chosen president and Dr. Gilbert C. Anderson, New Orleans, vice president. Dr. Louise C. Eisenhardt, New Haven, Conn., is secretary-treasurer.——Dr. Hugh S. Cumming, director of the Pan American Sanitary Bureau, was elected president of the fifth Pan American Conference of National Directors of Health, which met in the Pan American Union, Washington, April 22-29. Vice presidents are Dr. Manuel M. Báez, Mexico; Dr. Eugenio Suarez H., Chile; Dr. César G. Zuleta, Peru, and Dr. Leopoldo I. Perez, Ecuador. Aristides A. Moll, Ph.D., was elected secretary-general.——Icie G. Macy-Hoobler, Ph.D., Detroit, was elected president of the American Institute of Nutrition recently, William C. Rose, Ph.D., Urbana, Ill., vice president; Arthur H. Smith, Ph.D., Detroit, secretary, and Elmer M. Nelson, Ph.D., Washington, D. C., treasurer.——Dr. Charles D. Aring, Cincinnati, was chosen president of the American Branch of the International League Against Epilepsy at its meeting in Philadelphia, May 14. Dr. Haddow M. Keith, Rochester, Minn., is vice president and Dr. Frederic A. Gibbs, Boston, secretary-treasurer.

LATIN AMERICA

Health Activities in Latin America.—*Actions Taken at West Indian Conference.*—Of six general topics considered at the West Indian Conference of the Anglo-American Caribbean Commission in Barbados, British West Indies, March 21-30, three pertain to medicine and public health: health protection and quarantine, the planning of public works and thereby the provision of better facilities for environmental sanitation and medical care, and the establishment of a section on public health and medicine of the Caribbean Research Council. The conference unanimously adopted recommendations of the British West Indian Quarantine Conference in Trinidad in November 1943, which, among others, provided for the establishment of a West Indian Quarantine Bureau and the entering into of special agreements by the various British administrations which adopt uniform legislation with a view to reducing quarantine procedures between these colonies to a minimum, in connection with both sea and air traffic. In referring to the uniform procedures it was recommended that with application to the definition of "immune" used in the proposed model legislation the period of validity of a yellow fever inoculation certificate should be four years. In the attempt to reduce the incidence of tuberculosis, particularly where overcrowding is common, it was recommended that steps be taken to improve housing, to plan properly the control of the growth of towns and to educate the people in the healthful use of proper housing when provided. Special measures recommended the provision of diagnostic and therapeutic clinics and, in special areas, mobile equipment for effecting this work. Recommendations treating the venereal disease problem considered the urgent need for control of this disease in the Caribbean area, emphasizing the need for intensive programs and the acquisition of proper personnel to maintain the proper control. It was recommended that the cooperative program between Trinidad and the United States government should be initiated in other parts of the area. General recommendations provided that measures be effected to improve general sanitation, the nutritional status as well as the handling of food, and the provision of meals for school children and the distribution of milk, either free or on a contributory basis, to infants and other selected groups. A report on the planning of public works, also adopted unanimously, urged the construction of engineering projects, including water supplies, sewage disposal systems, drainage projects (malaria control) and building construction projects including hospitals, clinics and health centers, markets and shops and community buildings. The committee on planning of public works also recommended that a balance be established in the life of the community between such social functions as work, education, leisure and health. The Caribbean Research Council recommended that a sectional committee on public health and medicine be established within the council to concern itself with the general as well as the specific problems of public health and medicine in the Caribbean area, including the coordination and dissemination of available data in this field. It was urged that the collection and analysis of material relating to the current methods of control of various diseases endemic in the area, the promotion of investigations into better methods of diagnosis and control of diseases endemic in the Caribbean, and investigation of the relationship of human nutrition to health in the Caribbean population.

Deaths in Other Countries

Dr. Gina Lombroso Ferraro, said to be the first woman physician in Italy, died March 30, in Geneva, Switzerland, aged 73, newspapers reported. The report indicated that Dr. Ferraro had been born in Pavia and had obtained her medical degree from the University of Turin, the first woman to be so honored in Italy.——**James Crawford Simpson, LL.D.,** formerly associate dean, McGill University Faculty of Medicine, Montreal, died in Montreal April 20, aged 69.——**Dr. Juan Raúl Goyena,** Buenos Aires, Argentina, professor of clinical medicine, Faculty of Medicine of Buenos Aires and former president of the Asociación Médica Argentina, died Dec. 29, 1943.——**Dr. Eugen Steinach,** formerly professor of physiology, German University of Prague and the University at Vienna, died in Territet on Lake Geneva, Switzerland, May 14, aged 83. Dr. Steinach had left Austria when the Nazis took it over in 1938. In recent years he had carried on research in a laboratory that he established at Zurich, Switzerland.

CORRECTION

Evaluation of Studies on Gelatin Preparations for Intravenous Use.—In the item by this title in THE JOURNAL, May 27, page 284, in the third line of the first paragraph numbered 4 in the first column the word "desirable" should read "undesirable."

Government Services

Industrial Nutrition Committee

Dr. Leslie W. Foker, director of the Minnesota division of industrial health, is chairman of a new industrial nutrition committee, established in cooperation with the nutrition in industry service of the U. S. Food Distribution Administration.

Hazel Stiebeling Named Chief of Human Nutrition

Hazel K. Stiebeling, Ph.D., on May 18 was appointed chief of the bureau of human nutrition and home economics of the U. S. Department of Agriculture, effective June 30. She will succeed Henry C. Sherman, Ph.D. Dr. Stiebeling has been in the bureau since 1930, serving as assistant chief since 1943.

Trade Practice Conference for Hearing Aid Industry

A trade practice conference will be held under the auspices of the Federal Trade Commission for the hearing aid industry at the Hotel Cleveland, Cleveland, June 15, with Robert E. Freer, chairman of the commission, presiding. The conference was authorized by the commission on request of members of the industry for the purpose of promoting the maintenance of fair competitive conditions in the industry and for the protection of the buying public. Some of the practices which have been suggested as appropriate subjects for rules are misrepresentation of industry products and deceptive selling methods; deception through use of "blind" advertising; defamation of competitors or disparagement of their products; imitation or simulation of trademarks or trade names; unlawful price discriminations, and aiding or abetting others in the use of unfair trade practices. After the conference, and before rules are finally approved by the commission, the procedure requires that a draft of the proposed rules in appropriate form be released on public notice to all interested or affected parties and that they thereupon be afforded further opportunity to be heard and to present their views and suggestions in respect to such proposed rules.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 6, 1944.

Rehabilitation of Heart Patients

The council of the Cardiac Society of Great Britain and Ireland has issued, over the signatures of its president, Sir Maurice Cassidy, and its secretary, Dr. Maurice Campbell, a memorandum on the rehabilitation of cardiac patients. It is pointed out that these patients are in a rather special category. Any activity, including walking or other effort, must increase the work of the heart. If the patient is going to recover completely after some temporary infection, for example, cardiac recovery will often proceed *pari passu* with the general recovery, and nothing more than simple graduated exercises may be needed to insure recovery. Indeed, it may be necessary to limit rather than to encourage physical activity. In other cases complete recovery may be impossible, and it may be important that the patient should not return to his previous activity. Furthermore, correct diagnosis of the condition of the heart and assessment of the cardiac reserve are important if harm is not to be done by too much or too little activity.

There is only a limited scope for rehabilitation in organic cardiovascular disease. Physical therapy and graduated exercises are useful but must be supervised by a doctor with special knowledge of heart disease. The main problem is to decide how much general activity should be allowed. In some cases the heart is under suspicion which fuller investigation proves unjustified; for, example, there are systolic murmurs which are insignificant, but inexperienced advisers hesitate to disregard them. All that is necessary is an authoritative opinion that the heart is normal and the patient therefore fit for an active life. There is scope for rehabilitation in cases of "the effort syndrome," which may appear diagnosed as "cardiac anxiety state," "traumatic neurasthenia" or "postinfluenzal tachycardia." Rehabilitation of these patients, whether by graduated exercises or by psychotherapy, should not be carried out at cardiac clinics once it is decided that there is no organic disease.

There may be difficulty in finding suitable work for patients with some permanent limitation as a result of heart disease. The younger ones with rheumatic heart disease are precluded by medical examination from the most suitable occupations—civil service, banking and insurance. They are therefore forced to take less suitable work, under which they may break down. Alternatively, they may be unemployed, and the nation loses what might be valuable service. The society memorandum recommends that special arrangements should be made for accepting such patients in the occupations mentioned. Older patients beginning to suffer from early signs of cardiac failure, angina, hypertension, arteriosclerosis or myocardial disease may become unfit for their occupation. But they would often be better off at work yet cannot find lighter work which would be suitable. The society recommends that there should be some industrial advisory board or government department to make arrangements for suitable employment for these partially disabled persons, after they have had appropriate special training.

Symptomless Pulmonary Tuberculosis Detected by Radiography

In *Tubercle*, Dr. F. Temple Clive has produced remarkable evidence of the value of radiography in the detection of symptomless pulmonary tuberculosis. He has reviewed the radiography of 30,000 women recruits for the Women's Auxiliary Air Force. The women were to some extent selective, as they had all been previously examined at a national service medical board. Their ages ranged from 17½ to 45 years. All were practically symptomless, and those with any symptoms admitted them only after detailed history taking. All the women were on full duty, which included marching and physical training, yet even this strenuous exercise did not cause any woman to suspect that she was not perfectly well. The value of radiography was shown by the fact that 102 cases of active tuberculosis were found. Calcified nodules and/or glands were seen in 286 cases.

The absence of admitted symptoms was remarkable. After close questioning only 29 of the women with active tuberculosis admitted symptoms. These were chiefly lassitude, loss of weight and coughing, in this order. Four women with advanced tuberculosis were unaware of any symptom, although the prognosis was negative. In no less than 64 cases no significant history of any kind was obtained. In spite of the complete absence of symptoms almost half the cases had passed beyond the early stage. Cavitation was present in 16 unilateral and 4 bilateral cases. Thus 20 patients urgently required admission to an institution for collapse therapy.

Abnormal physical signs were found in the chest of 66 patients. This figure includes only cases in which signs were so definite that they should have been discovered by physicians not specially trained in chest work and without x-ray aid. The sputum was positive in 18 cases, negative in 33 and entirely absent in no fewer than 51. This figure is subject to correction because women tend to conceal that they have any sputum, and in spite of advice, are averse to expectoration.

Clubbing of the fingers occurred in 12 cases, in 3 of which it was the only sign. In 136 cases, or 0.45 per cent of the entire group, inactive pulmonary tuberculosis was found. The 102 patients with active tuberculosis represent a percentage of 0.34. These percentages may be compared with those for male recruits to the air force, which were 0.22 and 0.36 respectively. Thus the total percentage for the women was 0.79, and that for the men was 0.58. Below the age of 20 active tuberculosis was found to be twice as common in women as in men, and inactive tuberculosis three times as common.

Drug Addiction in Egypt

There is again a danger that drug addiction may become widespread in Egypt. The lack of ordinary stimulants such as alcohol is creating a fresh demand for narcotics. Although white drugs (cocaine, heroin) are almost unobtainable, much trafficking in hashish goes on. The main area in the Middle East for the cultivation of the cannabis plant is Syria and the Lebanon. To tighten control of production of this illegal plant Russell Pasha, chief of the Egyptian Central Narcotics Intelligence Bureau, recently visited these countries. He holds that the only sure method of preventing trafficking in hashish is to destroy the drug at its source. It is virtually impossible to prevent Syrian hashish from entering Egypt, with a continuous stream of military transport crossing the Syrian desert.

Before the war French authorities in Syria made the cultivation of cannabis illegal. But, in the confusion of wartime, cultivators have been able to replant their fields up to the Lebanon mountains. Now that the local authorities are taking over from the French fellaheen, who were the main users, it is the prosperous middle classes who form the clientèle of the traffickers. Gone too are the days of dirty little drug dens; addicts now smoke hashish in their homes. So determined are the fellaheen, however, to find a stimulant that some of them take with their tobacco grains of powdered hyoscyamus, with disastrous effects. Drug addiction brought great distress to Egypt in the late twenties and early thirties. Planned international measures will be necessary to prevent revival of the drug traffic.

BUENOS AIRES

(From Our Regular Correspondent)

April 18, 1944.

Regulations Governing Professional Practice

A law concerning the practice of medicine, odontology, obstetrics, nursing, optics, orthopedics and similar fields in Buenos Aires was recently proposed. A license from the National Department of Public Health and Social Assistance is required in practicing any of these professions, the law states. Professional persons should notify the local civil authorities as soon as they obtain their licenses to begin practice. The license should be renewed every five years. It will be voided by the National Department of Public Health as soon as the expiration of the license is reported to the department by the Office of Civil Protocols. The offices of professional persons should have all the hygienic and other requirements demanded by the law. Professional announcements should be ethical, scientific and honest. The advertisement of special methods for diagnosis, prognosis and therapy of diseases and claims for the value of mysterious and secret procedures and of infallible treatments for incurable diseases are prohibited. The price of consultation and offerings for reduction of fees should not appear on prescription blanks. The title of "specialist" can be used only by those who have a national diploma of the specialty as well as by those who have worked in the specialty for five years. Prescriptions should be clearly written in Spanish. The use of code words in prescriptions is prohibited. The prescription of alkaloids is circumscribed within severe regulations. The practices of sterilizing women without indispensable therapeutic indications and of provoking abortion are penalized. Practice in the course of infections and of contagious diseases is interdicted. Medicine and its allied professions should not be simultaneously practiced. Practicing physicians cannot be the owners of pharmacies, roentgen departments, laboratories or dietetic, optic, orthopedic or similar departments. Professional secrecy does not bind physicians in reporting infectious and contagious diseases or the cause of death from either epidemic diseases or crime. The practice of a profession by persons not professionally and properly prepared should not be tolerated. They will not direct the patients in their selection of pharmacies and laboratories. They are free, however, to recommend good sanatoriums and good hospitals. Partition of fees which are obtained through individual work is prohibited. Professional persons who simultaneously give medical and other care to a patient can collect payment for professional work either in one or in separate bills, according to their wishes. Those persons who have diplomas of universities of other countries are allowed to practice their professions after revalidation of their diplomas in Argentina. A professional license is withheld from those who become chronic alcoholic or drug addicts or are mentally ill. If violators of these laws discontinue the activity in question they can ask for renewal of their licenses. Otherwise the license is permanently nullified. Punishment for infractions will be in accordance with the national penal code. This includes temporary suspension of professional practice, fines up to the amount of 1,000 Argentine pesos ($250) and permanent revocation of license.

Meteorologic Factor in Poliomyelitis

Drs. C. Rossi Belgrano, W. Knoche and J. A. de Cendoya and the civil engineer Alfred G. Galmarini of the Department of Climatology of the Ministry of Agriculture of Argentina recently published the results of their studies on the meteorologic factors in poliomyelitis. They concluded that the following problems are still unsolved: 1. What is the reason for the appearance of epidemics of poliomyelitis in certain years and not in all? 2. Why do the epidemics occur in certain seasons of the year and not in others? 3. Why are the epidemics frequent in nontropical regions and infrequent in the tropics? The majority of researches carried on in the past to ascertain the causal relationship between the environment and the epidemiology of poliomyelitis have been insufficient, the authors found. Concerning the role of environment in relation to the geographic distribution of poliomyelitis, they point out, it has been concluded that possibly the meteorologic total ambient of certain regions may have an influence on the virus, on the individual or on both. The similarity encountered between the course of poliomyelitis and that of certain intestinal diseases is merely casual, it is stated, as is shown by the frequency of the latter diseases in tropical countries in which poliomyelitis is rare. Considering the geographic distribution of poliomyelitis and the appearance of epidemics in certain years and in certain seasons of the year, one finds that the atmospheric dynamism, that is, passages of fronts and changes of air masses (Knoche), is frequent in poliomyelitic regions and infrequent in tropical zones.

Medical Prize

The Winthrop Prize of Peru is given by the Winthrop Laboratories every year for the best scientific articles reported in Peru. The prize is now 2,000 gold soles ($1,000) to be awarded to three authors in the amounts of 1,000, 500 and 500 gold soles respectively. In 1943 the prizes were given to Drs. Juan B. Lastres, Oscar Urteaga Ballon and José Marroquín for their articles "Vida y Obras de Miguel Tafur," "Algunas Observaciones en el Campo de la Fisiología, Fisiopatología y Anatomía Patológica del Hígado en Relatcón con el Problema de la Ictericia" and "Apreciaciones Antropológicas sobre el Indígena del Perú" respectively. These articles were published in the *Anales de la Sociedad Peruana de Historia de la Medicina* (Lastres), the *Anales de la Facultad de Medicina* (Urteaga Ballon) and *La Crónica Médica* (Marroquín).

Medical Reunion

The Confederation of South American Societies of Pediatrics, which is made up of the pediatric societies of Argentina, Brazil, Chile and Uruguay, will meet in Santiago, Chile, during the last week of November 1944. The official topics to be discussed are (1) the examination of cerebral lesions in infants, (2) cardiac insufficiency and cardiomegaly in infants and (3) blood diseases in infants, with special reference to normal and pathologic hemograms and myelograms and hemorrhagiparous syndromes in infants. Drs. J. P. Garraham of Buenos Aires and his collaborators (also of Buenos Aires) and J. Bonaba, J. R. Marcos, María L. Saldún de Rodriguez and J. A. Soto are official speakers on the first two topics. The official speaker on the third topic has not as yet been appointed.

Marriages

William Lowndes Peple Jr., Richmond, Va., to Miss Margaret Ascherfeld of Baltimore, May 8.

Luther Randolph Doffermyre, Dunn, N. C., to Miss Margaret Johnson in Wilmington, April 9.

John G. Murray, New York, to Dr. Katharine Sams Tilson of New Haven, Conn., May 20.

James Lawrence Bradley, Lyons, N. Y., to Miss Mildred Ann Perkins of Syracuse, May 13.

Norman Eugene Beaver, Otterbein, Ind., to Miss Marjorie Cattelle in Indianapolis, May 14.

Deaths

Horace J. Whitacre ✠ Tacoma, Wash.; College of Physicians and Surgeons, New York, 1894; president of the Washington State Medical Association, 1931-1932; member and in 1936 president of the North Pacific Surgical Association; president of the Tacoma Surgical Club, 1929-1930, and the Pierce County Medical Society in 1940; member of the Pan Pacific Surgical Congress, American Association for the Surgery of Trauma, and member and state chairman of the American Society for the Control of Cancer; fellow and formerly member of the board of governors of the American College of Surgeons; president of the Public Health League of Washington from 1924 to 1926 and of the Physicians and Dentists Business Bureau from 1931 to 1939; formerly professor of pathology and lecturer on principles of surgery at the Medical College of Ohio, Cincinnati, where he served on the staffs of the Christ Hospital, Speers Memorial Hospital and the Cincinnati Hospital; consulting surgeon of the U. S. Veterans Bureau from 1919 to 1941; surgeon on the staff of the U. S. Veterans Hospital, and president of the staff of the Tacoma General Hospital, 1922-1923; chief of surgical service at Fort Lewis and served in France during World War I; surgical consultant for the state department of labor and industries; president of the Tacoma Chamber of Commerce in 1932 and the Rotary Club from 1919 to 1921; campaign chairman of the Tacoma Community Chest in 1922 and later trustee; president of the Y. M. C. A. from 1924 to 1927; received the honorary doctor of science degree from the College of Puget Sound in 1932; author of "Laboratory Textbook of Pathology" in 1897 and the Section on Dissection in Bryant and Buck's "Systems of Surgery"; died in Seattle March 10, aged 74, of complications following a suprapubic prostatectomy.

Henry Kennon Dunham ✠ Cincinnati; Miami Medical College, Cincinnati, 1894; assistant in medicine at his alma mater from 1896 to 1899; for many years associate professor of medicine at the University of Cincinnati College of Medicine, where he had been lecturer and demonstrator of electrotherapeutics and director of the tuberculosis service; specialist certified by the American Board of Radiology, Inc., and the American Board of Internal Medicine; a founder in 1907 and president of the Cincinnati Anti-Tuberculosis League, 1914-1915; a founder in 1901 and president of the Ohio Public Health Association from 1930 to 1933 and 1941-1942; president of the National Tuberculosis Association, 1934-1935; president of the Cincinnati Academy of Medicine in 1921; member of the American Association of Thoracic Surgery, American Clinical and Climatological Association, American Roentgen Ray, Radiological Society of North America, Inc., American Trudeau Society and the American College of Radiology; fellow of the American College of Physicians; medical director of the Hamilton County Tuberculosis Sanatorium from 1917 to 1940 and later chairman of the board of trustees; a captain in the medical corps of the U. S. Army during World War I, promoted to major, serving as chief of laboratory service at Oteen, N. C., in 1919; responsible for establishment in Cincinnati of the first Diagnostic Center of the Veterans Administration; served as director of the tuberculosis service of Cincinnati General Hospital; author of "Stereo-Roentgenography Pulmonary Tuberculosis," 1915; died April 27, aged 72, of coronary thrombosis.

Maynard Caldwell Harding ✠ San Diego, Calif.; Denver and Gross College of Medicine, Denver, 1906; at one time in charge of medical work in Mokpo, Korea, Russia; member of the American Academy of Orthopaedic Surgeons; founder and active member of the board of San Diego Society for Crippled Children; served as president of the Western Orthopedic Association; fellow of the American College of Surgeons; veteran of the Spanish-American War; served during World War I in Letterman General Hospital in San Francisco and at Camp Lewis Base Hospital, with the rank of major; at first chief of orthopedic service and later chief of surgical service at Camp Lewis; for many years on the staffs of the San Diego County General and Mercy hospitals; died February 12, aged 65, of hypertension.

William McDowell Doughty ✠ Cincinnati; Miami Medical College, Cincinnati, 1906; served as a member of the board of directors of the University of Cincinnati College of Medicine, where in 1936 he resigned as associate professor of radiology; specialist certified by the American Board of Radiology, Inc.; member of the American Roentgen Ray Society, of which he was president, 1941-1942, and vice president, 1938-1939; member of the Radiological Society of North America, Inc., and the American College of Radiology; fellow of the American College of Surgeons; attending radiologist, Christ Hospital, and director of radiology at the Children's Hospital; died in Lawrenceburg, Ind., April 18, aged 62, of coronary occlusion.

William Alfred Scruton, Mount Kisco, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1906; also a pharmacist; specialist certified by the American Board of Otolaryngology; fellow of the American College of Surgeons and the New York Academy of Medicine; served as a flight surgeon during World War I; formerly on the staffs of the Manhattan, Eye, Ear and Throat, New York Polyclinic and Willard Parker hospitals, New York; died March 23, aged 65, of cardiac failure and hypertensive cardiovascular disease.

Frederick Dunn, Springville, Utah; Rush Medical College, Chicago, 1885; served during World War I; major, medical reserve corps, U. S. Army, not on active duty; for many years a member of the Nebo district school board and physician for the Denver and Rio Grande Western Railroad; served for one term as mayor of the city of Springville; formerly superintendent of the Utah State Hospital, Provo; member of the board of directors of the Springville Banking Company; died March 19, aged 79, of myocarditis and rheumatic heart disease.

John Walter Alsobrook ✠ Plant City, Fla.; Vanderbilt University School of Medicine, Nashville, Tenn., 1904; past president of the Hillsborough County Medical Society; served as president of the Florida Railway Surgeons Association; local surgeon for the Atlantic Coast Line Railroad; served during World War I; first president of the Kiwanis Club; died April 19, aged 68, of coronary thrombosis, following progressive alveolar emphysema.

Robert Benda, New York; Deutsche Universität Medizinische Fakultät, Prague, Austria, 1914; member of the Medical Society of the State of New York; died in the Park East Hospital March 26, aged 53, of essential hypertension.

Walter Allen Blair ✠ Spangler, Pa.; Medico-Chirurgical College of Philadelphia, 1903; a member of the board of health of Spangler; at one time a member of the state legislature; member of the surgical staff, Miners' Hospital of Northern Cambria; formerly a director of the Keystone Bank of Spangler and a member of the school board of Patton; served for many years as company physician and surgeon for the Barnes and Tucker Coal Company and the Duncan-Spangler Coal Company; died March 20, aged 69, of obstructive jaundice.

Arthur Stephen Bliss, New Orleans; Pulte Medical College, Cincinnati, 1898; formerly mayor of Oak Grove, La.; served as president of the board of health in West Carroll Parish; died in the Touro Infirmary March 28, aged 69, of carcinoma of the rectum.

Robert Longhry Bone, Fort Lauderdale, Fla.; Vanderbilt University School of Medicine, Nashville, Tenn., 1882; formerly on the staff of the Hopkins County Hospital, Madisonville, Ky.; died March 25, aged 83, of arteriosclerosis and heart disease.

David Stanton Bordner, Palmyra, Pa.; Medico-Chirurgical College of Philadelphia, 1908; member of the Medical Society of the State of Pennsylvania; served as examining physician for Lebanon County Selective Service Board number 3 during World War II; died in the Lebanon Sanatorium, Lebanon, March 15, aged 65, of coronary thrombosis.

Camillo Chase Borruso, Middle Village, N. Y.; Loyola University School of Medicine, Chicago, 1931; captain in the medical corps, Army of the United States; relieved from active duty because of physical disability on March 25, 1944; attending surgeon, Tonsil Hospital, New York; served as medical superintendent of the Parkway Hospital, New York; died April 30, aged 41.

James E. Bow, Burkesville, Ky.; Louisville Medical College, 1893; member of the Kentucky State Medical Association; died in the T. J. Samson Community Hospital, Glasgow, February 24, aged 71, of cerebral hemorrhage.

John Hovey Bradley, Madison, Wis.; Rush Medical College, Chicago, 1898; died March 7, aged 70, of chronic arthritis and chronic myocarditis.

George Summerwell Bubb ✠ McKees Rocks, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1901; Spanish-American War veteran; on the staff of the Ohio Valley General Hospital, where he died March 20, aged 64, of heart disease.

Daniel N. Bulford ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1900; in 1935 appointed member of the state sanitary water board; died March 20, aged 71, of coronary occlusion.

William Battle Buntin, Tucson, Ariz.; Memphis (Tenn.) Hospital Medical College, 1900; died March 12, aged 71, of pneumonia.

Rose V. La Monte Burcham, Alhambra, Calif.; Eclectic Medical Institute, Cincinnati, 1884; died February 2, aged 86, of cardiac occlusion and arteriosclerosis.

Thomas A. Burkhart, Jasonville, Ind.; Medical College of Indiana, Indianapolis, 1903; member of the board of health; died March 17, aged 71, of cerebral hemorrhage.

Thomas Armer Burneson, Lisbon, Ohio; Hahnemann Medical College and Hospital of Philadelphia, 1897; died March 24, aged 83, of pneumonia.

Mary Ryerson Butin, Madera, Calif.; Woman's Medical College, Chicago, 1881; for many years city and county health officer; served as president of the city board of health; died March 30, aged 87, of chronic myocarditis.

M. Robert Byrnes, Indianola, Neb.; Grand Rapids Medical College, 1907; died in an Omaha hospital March 3, aged 73.

Robert Elliston Carlton, Covington, Ky.; Kentucky School of Medicine, Louisville, 1877; organized the Latonia Anti-Tuberculosis Society in 1902; one of the founders of the First National Bank of Latonia in 1902, of the Model Building & Loan Association in 1905, an of the Bank of Dayton in 1905; died March 3, aged 87.

Albert Orton Carmack ✠ Colome, S. D.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; died February 22, aged 70, of coronary occlusion.

Clarence Orrin Coburn ✠ Manchester, N. H.; Tufts College Medical School, Boston, 1906; president of the New Hampshire Medical Society in 1939; president of the medical staff at the Elliot Hospital; a vice president of the Manchester Rotary Club and a trustee of the Currier Gallery of Arts; died in Candia March 30, aged 61, of coronary thrombosis.

Lewis Charles Coleman ✠ Hazard, Ky.; University of Cincinnati College of Medicine, 1929; recently appointed health officer of Bell County; formerly health officer of Perry County; died in a Hazard hospital March 29, aged 40.

Robert Matthew Cox, Edmore, N. D.; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1905; died March 27, aged 68, of malignant lymphoma.

William de la Barre, Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1897; formerly on the staff of the Abbott Hospital; died in Edina March 26, aged 71, of terminal pneumonia and hypertension.

Neil J. Devers, Freeland, Pa.; Maryland Medical College, Baltimore, 1912; president of the board of health; formerly member of the school board; at one time deputy coroner of lower Luzerne County; one of the founders and member of the board of directors of the Freeland Building and Loan Association; died in the New York Hospital, New York, March 12, aged 59, of cirrhosis of the liver.

Stuart Lloyd DeWitt ✠ Grand Haven, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1911; past president of the Ottawa County Medical Society; until recently a member of the Selective Service Board number 2 of Ottawa County; member of the board of education, chamber of commerce and the Rotary Club; formerly acting assistant surgeon, U. S. Public Health Service; chief of surgery, Municipal Hospital, where he died March 29, aged 55, of coronary occlusion.

Henry J. Dionysius, Kirkwood, Mo.; Homeopathic Medical College of Missouri, St. Louis, 1880; died March 20, aged 85, of heart disease.

Francis James Dore ✠ Newton, Mass.; Harvard Medical School, Boston, 1902; an Associate Fellow of the American Medical Association; ordained a priest in 1916; for nineteen years head of the biology department at Boston College; regent of the school of pharmacy, Fordham University, New York, from 1918 to 1922; died in St. Elizabeth's Hospital, Boston, February 28, aged 65, of injuries received in an automobile accident.

Richard Benson Dugdale, South Bend, Ind.; Rush Medical College, Chicago, 1892; member of the Indiana State Medical Association; past president and secretary-treasurer of the St. Joseph County Medical Society; for many years member and president of the board of education; served as county coroner; formerly on the staff of Epworth Hospital; died February 15, aged 75, of cerebral emboli and arteriosclerosis.

Rudolph T. Ehrhardt, St. Louis; St. Louis Medical College, 1886; at one time physician for the Chicago, Burlington and Quincy Railroad; died in the Barnes Hospital March 24, aged 79, of cerebral thrombosis.

John Philip Emich ✠ Philadelphia; Temple University School of Medicine, Philadelphia, 1910; associate professor of surgery at his alma mater; served as president and secretary of the Babcock Surgical Society; on the staff of the Temple University Hospital; died March 21, aged 63, of coronary thrombosis.

Paul J Faust, Chicago; University of Colorado School of Medicine, Denver, 1929; served as resident psychiatrist on the staffs of the Gardner State Hospital, Gardner, Mass., Logansport State Hospital, Logansport, Ind., Peoria State Hospital, Peoria, Ill., and the Chicago State Hospital, where he died March 13, aged 41.

John Salvatore Fiorella, Buffalo; Creighton University School of Medicine, Omaha, 1936; attending physician at the Lafayette General Hospital, where he died March 19, aged 34, of coronary thrombosis, hypertension and chronic nephritis.

Isadore Flatto, New York; Columbia University College of Physicians and Surgeons, New York, 1904; died March 15, aged 64.

William Howard Force, Ludington, Mich.; Detroit College of Medicine, 1908; member of the Michigan State Medical Society; served as a captain in the medical corps of the U. S. Army during World War I; for nine years health officer of Ludington; on the staff of the Paulina Stearns Hospital; died March 28, aged 74, of angina pectoris.

Jesse Bernard Francis, Troy, Ohio; the Hahnemann Medical College and Hospital, Chicago, 1908; served during World War I; died in Asheville, N. C., March 21, aged 61, of cardiorenal disease.

Louis Julian Genella, Kenner, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1898; member of the Louisiana State Medical Society; veteran of the Spanish-American War and World War I; died in New Orleans February 27, aged 69.

Frank Theophile Gouaux Sr. ✠ Lockport, La.; Medico-Chirurgical College of Philadelphia, 1906; past president of the Louisiana State Medical Society and councilor of the Third District; on the visiting staff of Hotel Dieu, New Orleans, where he died March 19, aged 61, of carcinoma of the lower bowel.

Charles Hamil, Greenview, Ill.; Rush Medical College, Chicago, 1884; a member of the "Fifty Year Club" of the Illinois State Medical Society; died March 6, aged 90, of senility.

Weller H. Hoff, Paris, Ill.; Medical College of Ohio, Cincinnati, 1896; formerly mayor of Paris; at one time president of the Illinois Municipal League; served as president of the Aesculapian Society of Wabash Valley; died March 16, aged 74, of a self-inflicted bullet wound.

Harriet Ann Hook, Detroit; Rush Medical College, Chicago, 1905; died in the Dorothy Roger's General Hospital March 9, aged 67, of cardiac failure, following chronic myocarditis.

Peter David Hottenstein, Philadelphia; Medico-Chirurgical College of Philadelphia, 1903; on the staff of the Belmont Hospital; died at his home in Brookthorpe Hills, Pa., March 4, aged 69, of coronary thrombosis.

Margaret Emily Pagelsen Howard, Reading, Mass.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1882; member of the Massachusetts Medical Society; served as resident physician at the New England Hospital for Women and Children, Boston, and president of the board of directors; formerly trustee of the Boston State Hospital; died in Boston March 1, aged 84.

Edward Victor Hug, Lorain, Ohio; Jefferson Medical College of Philadelphia, 1893; past president and secretary of the Lorain County Medical Society; organizer of the Lorain County Society for Prevention and Treatment of Tuberculosis; served as a member of the board of health and for many years as health officer; on the staff of St. Joseph's Hospital; died April 15, aged 74, of myocardial degeneration.

Frederic A. Jackson ✠ El Dorado, Wis.; Milwaukee Medical College, 1905; died March 21, aged 72, of myocarditis.

Zebulon Vance Johnston ✠ Calhoun, Ga.; Atlanta College of Physicians and Surgeons, 1910; an organizer and first

commanding officer of the medical detachment of the Florida National Guard; served in France during World War I; past president of the Seventh District Medical Society; first president of the Calhoun Rotary Club; recently appointed a member of the staff of Governor Ellis Arnall; medical superintendent of the Johnston-Hall Hospital, where he died March 13, aged 59.

Robert John Judkins, Bainbridge, Ohio; Ohio-Miami Medical College of the University of Cincinnati, 1912; died March 19, aged 57, of coronary thrombosis.

Louis Karmiohl ✦ New York; University and Bellevue Hospital Medical College, New York, 1903; had been a member of the city board of health; served during World War I; died February 22, aged 63, of cerebral thrombosis.

Alexander Eli Kaufman, Chicago; Université de Lausanne Faculté de Medecine, Switzerland, 1939; Chicago Medical School, 1932; member of the Illinois State Medical Society; died March 9, aged 45, of hypertensive heart disease and chronic myocarditis.

Isaac W. Keenan, Fort Myers, Fla.; Jefferson Medical College of Philadelphia, 1895; at one time owner of the Keenan Hospital in Cambridge, Ohio; died March 15, aged 75.

Guy William Kennicott, Chehalis, Wash.; Rush Medical College, Chicago, 1885; member of the Washington State Medical Association; health officer of Chehalis; formerly surgeon and owner of the Chehalis General Hospital; died in Centralia, March 13, aged 85, of heart disease.

Charles W. Kibbe, Abbeville, La.; University of the South Medical Department, Sewanee, Tenn., 1901; died March 3, aged 68, of coronary thrombosis.

George Fred Klugh Jr. ✦ Atlanta, Ga.; Emory University School of Medicine, Atlanta, 1932; served as a first lieutenant in the medical reserve corps of the U. S. Army from Dec. 20, 1940 to June 18, 1941, when he retired; on the staffs of the Crawford W. Long Memorial Hospital, Georgia Baptist Hospital and the Good Samaritan Clinic; died in Brunswick, March 15, aged 37.

LIEUT. NORMAN B. GEYER (MC), U.S.N.R., 1914-1943

CAPT. ALFRED R. SCHROEDER, M. R. C., U. S. Army, 1912-1944

Warren Daniel Kunkel, Allentown, Pa.; Medico-Chirurgical College of Philadelphia, 1901; died in the Allentown Hospital March 10, aged 64, of myocarditis and cerebral hemorrhage.

William Godfrey LeFurgy ✦ Larchmont, N. Y.; Boston University School of Medicine, 1924; diplomate of the National Board of Medical Examiners; served as police surgeon in Mamaroneck; on the staff of the New Rochelle Hospital, New Rochelle; died March 29, aged 44, of cerebral hemorrhage.

Henry Havelock McCrea, Matamoras, Pa.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1899; member of the Medical Society of the State of New York; died at West Palm Beach, Fla., March 10, aged 67, of coronary thrombosis.

Angus C. McDonald, Warsaw, Ind.; University of Pennsylvania Department of Medicine, Philadelphia, 1892; member and past president of the Indiana State Medical Association; fellow of the American College of Surgeons; past president of the Kosciusko County and the Thirteenth District medical societies; served as a member of the state board of health; on the staff of the McDonald Hospital, which was named for him; a director of the Indiana State Bank and Trust Company; died April 23, aged 79, of carcinoma of the stomach.

Louis Edward Mannix, Chicopee Falls, Mass.; Tufts College Medical School, Boston, 1908; member of the Massachusetts Medical Society; served during World War I; chairman of the Chicopee chapter of the American Red Cross; served on the staffs of the Providence Hospital, Holyoke, and the Mercy Hospital, Springfield, where he died March 11, aged 59, of coronary thrombosis.

James Howard Mason, Plainfield, Iowa; Drake University College of Medicine, Des Moines, 1904; member of the Iowa State Medical Society; died February 23, aged 70, of heart disease.

Charles S. Meradith, San Gabriel, Calif.; University Medical College of Kansas City, Mo., 1891; died in Baldwin Park March 5, aged 90, of senility.

Arthur Claude Munns, Detroit; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1905; served on the staffs of the Providence Hospital and the Grace Hospital, Northwestern Branch, where he died February 21, aged 71, of pneumonitis.

Parry Ward O'Donnell, Allentown, Pa.; Georgetown University School of Medicine, Washington, D. C., 1928; captain, medical corps, Army of the United States, not on active duty; found dead April 7, aged 40, of carbon monoxide poisoning.

James Edward O'Toole, Scranton, Pa.; Medico-Chirurgical College of Philadelphia, 1910; member of the Medical Society of the State of Pennsylvania; served during World War I; died February 21, aged 60.

Florence Harvey Richards, Philadelphia; Woman's Medical College of Pennsylvania, Philadelphia, 1899; member of the Medical Society of the State of Pennsylvania; formerly on the staffs of the Philadelphia Polyclinic and the Woman's Hospital; served as head of the department of hygiene and medical director of the William Penn High School; died February 13, aged 66.

William Spurrier Sandbach, Pembroke, Ky.; Hospital College of Medicine, Louisville, 1907; member of the Kentucky State Medical Association; past president and secretary of the Christian County Medical Society; chairman of the school board of Pembroke and the Christian County Board of Health; served on the staff of the Jennie Stuart Memorial Hospital, Hopkinsville; died March 21, aged 64, of heart disease.

KILLED IN ACTION

Norman Byron Geyer, Chicago; University of Illinois College of Medicine, Chicago, 1941; completed an internship at the Michael Reese Hospital; commissioned a lieutenant (jg) in the medical corps, U. S. Naval Reserve, on Aug. 27, 1941 and later promoted to lieutenant; killed in action in the Pacific area; aged 29; the presumptive date of death by the Navy Department is Nov. 16, 1943.

Alfred Richard Schroeder, Lakewood, N. J.; Georgetown University School of Medicine, Washington, D. C., 1938; diplomate of the National Board of Medical Examiners; fellow in surgery and formerly instructor in pathology at his alma mater; on the staff of the Georgetown University Hospital, Washington, D. C.; commissioned a first lieutenant in the medical reserve corps of the U. S. Army on June 13, 1938 and later promoted to captain; killed in action at Anzio February 7, aged 31.

Correspondence

VISUAL TESTS FOR MALINGERING

To the Editor:—In a communication in THE JOURNAL, March 11, Dr. Rodney R. Beard questions my conclusions as set forth in THE JOURNAL, January 29. It appears that Dr. Beard, like others, falls into the error of regarding the visual angle of 5 minutes of arc as a fixed and constant factor in any test of acuity of vision and as having no relation with or dependence on a specific examinating distance. A premise as faulty as this can hardly lead to anything but confusion.

It is stated that many can see letters subtending 5 minutes from a distance of 5 feet (visual acuity 5/5) yet cannot read type subtending 20 minutes from a distance of 20 feet (visual acuity less than 20/80). In this Dr. Beard plainly errs. The expression visual acuity 5/5 is in this connection clearly an anomaly and does not conform in any respect to a Snellen notation. According to Snellen, the acuteness of vision is expressed by a fraction the numerator of which represents the number of feet between patient and chart and the denominator indicating the distance in number of feet at which the smallest letters are read by the normal eye. In other words, the Snellen visual formula expresses a true ratio, i. e. a relation of one quantity to another of the same kind, while simultaneously connoting one or more aliquot parts of a unit—in short, it is a fraction and so cannot refer, as in the instance cited, to a comparison or relation of a distance in number of feet and a visual angle in minutes of arc, or vice versa.

Dr. Beard's expression of visual acuity 5/5 should really have read visual acuity 5/20, since what is normally seen at a distance of 20 feet is here seen at the distance of 5 feet, and the visual angle of 5 minutes of arc so designed for the normal eye from a distance of 20 feet is then a visual angle of 20 minutes of arc at the distance of 5 feet. Similarly, when test type normally distinguishable under a 5 minute angle at a distance of 80 feet is just recognizable at the distance of 20 feet, the acuteness of vision is accordingly denoted 20/80, and the subtending visual angle for the latter at this distance is in like manner 20 minutes of arc. Hence, inexorably it will follow that 5/20 (20 minutes of arc) is comparable to and the equivalent of 20/80 (20 minutes of arc).

Now it is obvious that in determining different degrees of visual acuity one of two things must occur: either the distance of the test chart or the subtending angle must change, and in either event the size of the test object will vary depending on how far the chart is removed from the eye or the visual angle increased or decreased, as the case may be.

That the Snellen notation satisfies the requirements of a true fraction has already been established, and that moreover this does not represent the fraction of vision existing but does afford the sine qua non for so measuring the value of vision is also on record. Briefly, given a Snellen notation or its subtending angle, viz. the linear dimension, and the dimension sought for squared, the resulting value will in the Snellen sense be that of the corresponding surface area of a square. Therefore the value of vision is actually measured not by the linear unit (fractional notation, or visual angle) but by the corresponding unit of surface area, that is the surface area of a square (*Arch. Ophth.* **55**:58 [Jan.] 1926).

Finally, it may not be questioned that, as defined, Snellen notations are comparable values, and under the proper conditions transposable, and that the use of a correct formula for any such conversion is in fact a sound and valid procedure (*ibid.* **30**:138 [July], 377 [Sept.] 1943).

J. A. C. GABRIELS, M.D., Albany, N. Y.

[The letter was referred to Dr. Beard, who replies:]

To the Editor:—Dr. Gabriels moves too fast in arriving at his conclusion in paragraph 2 that "Dr. Beard plainly errs." The statement which he criticizes was intended to say just what is there, and neither more nor less.

The point under discussion is whether or not the so-called naval or "approach" method of recording vision deserves wider application as a quick and reliable test for malingering. My position is that it does not, because the person with myopia has sharp vision for objects closer than his far point but at greater distances sees a blurred image. Thus, the myopic eye which can be corrected by a ½ diopter concave lens, and the far point of which is at 2 meters, can form as sharp an image of objects within this 2 meter distance as any other eye but beyond that distance forms a blurred image.

In the long run, of course, practical observation must be the basis for decision as to the value of Dr. Gabriels' suggestion. My interest in this matter was aroused, prior to Dr. Gabriels' communication, by repeated observations that the simple multiplication (by appropriate factors) of the Snellen notation for acuity often failed to give figures which checked with those found by tests at varying distances under circumstances where malingering was unlikely. While the method suggested is not without value if it is applied by one with thorough understanding of the various optical and psychologic factors involved, I feel that, in the hands of most examiners, it would lead to false accusations of malingering for a considerable number of persons with mild myopia.

RODNEY R. BEARD, M.D., San Francisco.

"AN UNUSUAL MODE OF ACTION OF DIGITALIS IN AURICULAR FIBRILLATION"

To the Editor:—Dr. E. R. Movitt in an article in THE JOURNAL, April 29, page 1240, reports that during the course of administration of digitalis to patients with auricular fibrillation and a rapid heart rate "in 2 cases . . . not only did slowing of the ventricular rate occur, but also a reversal to sinus mechanism took place. On search of the literature a report with similar observations was found."

This implies that only one previous report of the changing of auricular fibrillation to sinus rhythm following the administration of digitalis has been published. However, in an article entitled "A Preliminary Investigation of the Therapeutic Value of Lanatoside C" in the *American Heart Journal* **21**:133 (Feb.) 1941 George Fahr and I reported that 8 of 102 patients with nonparoxysmal auricular fibrillation of several months' duration developed normal sinus rhythm while taking lanatoside C. An incidence of 7.8 per cent suggests that this phenomenon is not so "unusual" as is generally supposed.

JOHN S. LA DUE, M.D., New Orleans.

SECTION ON MEDICAL HISTORY

To the Editor:—I have read Dr. Holcomb's communication in THE JOURNAL, April 29, with regard to the formation of a section on medical history in the Association. I agree wholeheartedly that the Association should interest itself in medical history both old and new. Santayana said "He who cannot remember history is condemned to repeat it." Such self-evident truth is often forgotten by busy men, but it should be the business of the American Medical Association to remember history as well as make it.

JOSIAH C. TRENT, M.D., Durham, N. C.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the Examining Boards in Specialties were published in THE JOURNAL, June 3, page 377.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, Oct. 24-26. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ALASKA: Juneau, September 5. Sec., Dr. W. M. Whitehead, Box 561, Juneau.

CALIFORNIA: San Francisco, June 27-29 Sec., Dr. Frederick N. Scatena, 1020 N St., Sacramento.

CONNECTICUT:* *Written.* New Haven, July 11-12. *Endorsement* New Haven, July 25. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, July 11-12. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, Oct. 10-12. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA:* Washington, November. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA:* Jacksonville, June 26-27. Sec., Dr. W. M. Rowlett, Box 786, Tampa.

HAWAII: Honolulu, July 10-13. Sec., Dr. J. A. Morgan, 55 Young Bldg., Honolulu.

IDAHO: Boise, July 11. Dir., Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

IOWA:* Iowa City, Sept. 25-27. Dir. Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: November. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, Sept. 11-12. Sec., State Board of Health, Dr. Philip E. Blackerby, 620 S. Third St., Louisville.

LOUISIANA: September. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MAINE: Augusta, July 5-6. Sec., Board of Registration of Medicine, 192 State St., Portland.

MARYLAND: *Medical.* Baltimore, June 13-16. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 20-21. Sec. Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 11-14. Sec., Board of Registration in Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston.

MICHIGAN:* Ann Arbor, July 24-26. Final date for filing application is June 23. Sec., Board of Registration in Medicine, Dr. J. E. McIntyre, 100 W. Allegan St., Lansing.

MINNESOTA:* Minneapolis, June 20-22 and Aug. 29-31. Sec., Dr. J. F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSOURI: St. Louis, August. Sec., State Board of Health, Dr. James Stewart, State Capitol Bldg., Jefferson City.

NEBRASKA:* Omaha, Sept. 26-28. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

NEW HAMPSHIRE: Concord, Sept. 14-15. Sec., Board of Registration in Medicine, Dr. D. G. Smith, 77 Main St., Nashua.

NEW JERSEY: Trenton, June 20-21. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York City and Syracuse, June 26-29. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

NORTH CAROLINA: Raleigh, September. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, July 5-8. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Endorsement.* Columbus, July 4. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA:* Oklahoma City, Sept. 16. Sec., Dr. J. D. Osborn, Jr., Frederick.

OREGON:* Portland. July 26-27. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Harrisburg, July 11-15. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. M. G. Steiner, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, June 26-28. Sec., Dr. N. B. Heyward, 1329 Blandena St., Columbia.

TEXAS: Galveston, June 26-28. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas.

VERMONT: Burlington, Sept. 12-14. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, Sept. 19-22. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WISCONSIN:* Milwaukee, June 27-29. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT: June 10. Address State Board of Healing Arts, 250 Church St., New Haven 10.

DISTRICT OF COLUMBIA: Washington, October. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

IOWA: Des Moines, July 11. Dir., Division of Licensure and Registration. Mr. H. W. Grefe, Capitol Bldg., Des Moines.

NEW MEXICO: Santa Fe, June 12. Sec., Miss Marian M. Rhea, State Capitol Bldg., Santa Fe.

OKLAHOMA: Oklahoma City, July 3. Sec., Dr. J. D. Osborn Jr., Frederick.

OREGON: Corvallis, July 8. Final date for filing application is June 21. Sec., Board of Higher Education, Mr. C. D. Byrne, Eugene.

TENNESSEE: Nashville and Memphis, June 23-24. Sec., Dr. O. W. Hyman, Memphis.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Governmental Hospitals: Validity of Rule Restricting Right of Staff Members to Perform Major Surgery.—The city of St. Petersburg, Fla., owns and operates Mound Park Hospital, whose rules and regulations, promulgated by the city manager, limit the rights of members of the medical staff of the hospital to utilize hospital facilities. A member of the general medical staff is permitted full use of hospital facilities except for the performance of major surgery. Such a staff member is eligible for appointment on the junior surgical staff for a probationary period of at least two years and may then be appointed to the associate surgical staff, where he is required to perform twenty major operations under competent supervision. On successfully completing this requirement a physician is awarded membership on the major surgical staff and as such is entitled to unrestricted use of hospital facilities for major operations. Green, a resident physician and a taxpayer of the city, was a member of the general staff of the hospital and demanded of the city manager permission to use hospital facilities for the performance of major operations. When his demand was denied he filed a bill in equity to restrain the city from interfering with him in the use of hospital facilities. The trial court held against him, and he appealed by certiorari to the Supreme Court of Florida.

The question presented for our determination, said the Supreme Court, is whether Green, as a resident physician and a taxpayer of St. Petersburg, has a legal right to the unrestricted use of the facilities of the hospital in question. Under the common law it was not a function of government to own or administer hospitals. Sanction for their ownership must therefore be sought under some specific statute. Chapter 15505, Special Acts of 1931, authorizes the city of St. Petersburg to establish and maintain hospitals. The hospital in question was constructed according to this statutory authority and is being operated as one of the administrative departments of the city. The city manager is clothed with power to prescribe rules and regulations for its administration. The hospital is operated by the city in its corporate capacity and is on the list of hospitals approved by the American Medical Association and by the American College of Surgeons. To enjoy the privileges attendant on such approval, the hospital is required to and does maintain a specified staff organization and prescribed rules governing that staff, as previously referred to in this abstract. The reason for those rules is to establish and uphold high standards for the hospital, to insure that those entering the hospital for treatment secure skilful service and to protect the city and its taxpayers in the administration of the hospital. The rules are not designed to discriminate against any physician, but all physicians are required to conform to them as a prerequisite to the use of the hospital facilities.

A municipality, continued the court, may regulate and control the operation of a hospital provided by it and in the exercise of that power may exclude physicians not shown to have met its requirements. *Richardson* v. *City of Miami,* 144 Fla. 294, 198 So. 51. There is no question as to the power of a munici-

pality to prescribe reasonable rules and regulations defining qualifications to practice the medical profession in a hospital provided by it. *Hayman* v. *City of Galveston*, 273 U. S. 414, 47 S. Ct. 363, 71 L. Ed. 714; *Harris* v. *Thomas*, Texas Civ. App., 217 S. W. 1068; *City of Miami* v. *Oates*, Fla., 10 So. (2d) 721. Green has the unrestricted use of the hospital here involved for all purposes except for the performance of major surgery, and he desires to acquire the right of performing major surgery in the hospital without complying with the rules of the hospital in that respect, notwithstanding the fact that every other physician who practices major surgery in the hospital has complied with these rules. He contends that he should be given a privilege not given to the members of the medical profession generally. According to his contention, as a resident taxpayer and practicing physician in the city he has a constitutional right to the unrestricted use of the facilities of the hospital. The practice of major surgery is a highly specialized field and is a delicate art. Admittedly it requires special skill and training, and the majority of physicians do not pretend to enter the field. It is an art that cannot be acquired by technical training alone but must come through actual practice and experience. Skill in materia medica in no sense connotes skill in major surgery. It is utterly futile to contend in our day that one be permitted to take a scalpel in hand and explore the cranium, the thorax or the abdomen and patch the viscera, remove a tumor or amputate a limb before he demonstrates his qualification to do so. Most assuredly when a municipality furnishes a hospital, operating room and other facilities for doing this and is responsible to patients for the negligent use of these facilities, it has a right to know that they are placed in the hands of an expert. If this is not true, the city and the taxpayer have no protection whatever. It would project the doctrine of freedom and equality into unwarranted areas to hold that one could practice major surgery with facilities furnished by the city when he has nothing more than a diploma from a medical school and a certificate from the state board of medical examiners to warrant his skill in that field.

The doctrine of freedom, continued the court, as employed in the democratic state has reference to man's free agency, to freedom of opportunity and equality before the law, to freedom to own property, to trade with whom he will, to go and come as he pleases, to worship God as his conscience dictates, to marry whom he or she can and to speak his mind, if he has one, on any question. There was nothing more fundamental in the Jeffersonian concept of democracy than this, that democratic institutions must keep pace with new truths and new discoveries and, as these advance, opinions must change and advance with them. To the end that these things be accomplished, said Jefferson, nature has wisely provided an aristocracy of virtue and talent to direct the interests of society. The first concern of a free society is the welfare of the individual, the intelligent administration of his social, political and cultural interests. Constitutional guaranties were not designed to intercept or stalemate progress in these factors; neither were they intended to hamper a community in raising the standard of its schools, hospitals and other institutions as high as reason and circumstances dictate. In this case the people of St. Petersburg have elected to own and support a hospital of approved high standards, and none of them are here complaining. Appellant says he should not be required to bring himself in rapport with the standards imposed by the community in which he proposes to practice. He does not intimate that the standards imposed are too high or out of line with those generally approved for the conduct of a first class hospital. If this thesis be sound, then there is no standard of excellence that the city can impose to protect itself against the assault made. Constitutional guaranties, individual diversities and the public welfare cannot always be reconciled; but, when they do clash, the public welfare is paramount and the right of free enterprise should be construed to preserve that. It may be that the means provided in this case to reveal the "aristocracy of virtue and talent" to do major surgery are crude, but it is not shown that they do not afford a measure of protection to the public and certainly they are ample to require that major surgery be done by the latest and best approved standards. No practitioner has a right to exploit the art under any other. When the city furnishes the facilities and takes the risk against their negligent use, it is not too much to require that he who wields the knife does so in the philosophy of the twentieth rather than in that of the eighteenth century.

Green next contended that the city manager was without lawful authority to promulgate the rules and regulations in question and that the regulations should have been promulgated by the city council. It is sufficient in answer to this, said the court, to point out that the city charter authorizes the city council to conduct all the administrative departments of the city through the city manager, who is fully authorized to promulgate rules and regulations for the conduct of the hospital. The legislature was empowered to authorize this. Whether or not it was the best or wisest way is no concern of ours. Green then contended that the rules and regulations were unreasonable and arbitrary as applied to him and that they are subject to administration in such an arbitrary and unreasonable manner as to bar him from the use of the hospital in performing major surgery, should he qualify in other respects as such. This objection, said the court, is based on pure speculation as to the course pursued by those vested with the prerogative of administering the rules. The question has been prematurely raised. Unquestionably one should be given ample opportunity to qualify as "a major surgeon" under the rules of the hospital. If the rules are arbitrarily enforced in a way to bar instead of to qualify Green, he will then have reason to raise the question; but we refuse to indulge the presumption that he will not be treated fairly. He is well within his right to seek relief against unreasonable application of a rule but not against one that requires the same standard of excellence from him that it requires from all in his class. If he can demonstrate to the city manager that he is the skilled surgeon that he claims to be and has in all respects complied with the prerequisites imposed by the hospital, he should be given consideration for this; but the mere fact that he is a physician and a taxpayer in the city is insufficient to warrant relief that he seeks at this time.

Accordingly, the Supreme Court affirmed the judgment of the lower court, which in effect denied Green the relief he sought. —*Green v. City of St. Petersburg, 17 So. (2d) 517 (Fla., 1944).*

Society Proceedings

COMING MEETINGS

American Medical Association, Chicago, June 12-16. Dr. Olin West, 535 N. Dearborn St., Chicago 10, Secretary.

American Academy of Tuberculosis Physicians, Chicago, June 13. Dr. Oscar S. Levin, P. O. Box 7011, Denver, Colo., Secretary.

American College of Allergists, Chicago, June 10-11. Dr. Fred W. Wittich, 401 LaSalle Medical Bldg., Minneapolis 2, Secretary.

American College of Chest Physicians, Chicago, June 10-12. Dr. Paul H. Holinger, 500 N. Dearborn St., Chicago, Secretary.

American Diabetes Association, Chicago, June 11. Dr. Cecil Striker, 630 Vine St., Cincinnati 2, Secretary.

American Federation for Clinical Research, Chicago, June 12-13. Dr. Thomas M. Durant, 3401 N. Broad St., Philadelphia 40, Secretary.

American Gastro-Enterological Association, Chicago, June 12-13. Dr. J. Arnold Bargen, 102 Second Ave. S.W., Rochester, Minn., Secretary.

American Gynecological Society, Hershey, Penna., June 19-21. Dr. Howard C. Taylor Jr., 842 Park Ave., New York 21, Secretary.

American Medical Women's Association, Chicago, June 10-11. Dr. Carroll L. Birch, 2045 Sedgwick St., Chicago, Secretary.

American Physicians' Art Association, Chicago, June 12-16. Dr. F. H. Redewill, 536 Flood Bldg., San Francisco, Secretary.

American Proctologic Society, Chicago, June 11-13. Dr. W. H. Daniel, 1930 Wilshire Blvd., Los Angeles 5, Secretary.

American Society for Research in Psychosomatic Problems, Chicago, June 10-11. Dr. Edwin G. Zabriskie, 115 East 61st St., New York, Secretary.

American Urological Association, St. Louis, June 19-22. Dr. Thomas D. Moore, 899 Madison Ave., Memphis, 3, Tenn., Secretary.

Association for Research in Ophthalmology, Chicago, June 13. Dr. B. F. Payne, School of Aviation Medicine, Randolph Field, Texas, Secretary.

Association for the Study of Internal Secretions, Chicago, June 12-13. Dr. Henry H. Turner, 1200 N. Walker St., Oklahoma City, Secretary.

Maine Medical Association, Rockland, June 25-27. Dr. Frederick R. Carter, 142 High Street, Portland 3, Secretary.

Society for Investigative Dermatology, Chicago, June 13. Dr. S. W. Becker, 55 E. Washington St., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1934 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

67:167-246 (March) 1944

Development and Growth of Human Embryo and Fetus: Graphic Representation of Some Aspects. H. W. Clatworthy Jr. and R. G. Anderson.—p. 167.
Psychogenic Fever in Infants. H. Bakwin.—p. 176.
Rheumatic Infections in Cincinnati Hospitals: Study of 3,475 Admissions from 1930 to 1940; Comparison with Incidence in Philadelphia Hospitals from 1930 to 1934. A. G. Wedum and Bernice G. Wedum.—p. 182.
*Vitamin A Absorption Test in Cases in Giardiasis. C. P. Katsampes, Augusta B. McCoord and W. A. Phillips.—p. 189.
Influenzal Meningitis. M. Birdsong, W. W. Waddell Jr. and Betty W. Whitehead.—p. 194.
*Similar Urogenital Anomalies in Identical Twins. J. K. Lattimer.—p. 199.
Arachnodactyly in 4 Siblings with Pneumoencephalographic Observations of 2. H. D. Pasachoff, M. J. Madonick and C. Drayer.—p. 201.
Mental Development of Congenitally Hypothyroid Children: Its Relationship to Physical Development and Adequacy of Treatment. Hilde Bruch and D. J. McCune.—p. 205.

Vitamin A Absorption in Giardiasis.—Katsampes and his associates employed the vitamin A absorption test to study the ability of the intestine to absorb fat in children in whom giardiasis had been diagnosed by the detection of the parasite in the stools or duodenal contents. In 3 of the 15 patients studied none of the symptoms commonly attributed to the parasitic infestation were present. The remaining 12 patients had symptoms fitting closely into the clinical picture of giardiasis. The tests indicated that the infection with Giardia lamblia in children seriously interfered with the absorption of vitamin A and in all probability with the absorption of other fat soluble vitamins as well. The authors conclude that this organism is pathogenic in children. After the parasites were eliminated by treatment with quinacrine hydrochloride, the health of the patients and the ability to absorb vitamin A were much improved. In control patients with celiac disease treatment with quinacrine hydrochloride did not influence the absorption of vitamin A.

Urogenital Anomalies in Twins.—Lattimer observed identical twins, aged 10, who had identical strictures of the urinary meatus. The same degree of dilatation of the bladder was present in each boy, with mild hydronephrosis and hypertension. After meatotomy the dilatation of the urinary tract decreased gradually, and the blood pressure fell to normal levels. These cases furnished an illustration of the fact that when a urogenital anomaly occurs in an identical twin one often sees the same anomaly reproduced in the other twin.

American Journal of Ophthalmology, Cincinnati

27:217-340 (March) 1944

Pigment Freckles of Iris (Benign Melanomas): Their Significance in Relation to Malignant Melanoma of Uvea. A. B. Reese.—p. 217.
Solar Keratoconjunctivitis Associated with Amblyopia: Report of 2 Cases. C. Berens and P. T. McAlpine.—p. 227.
Less Evident Causes of Lowered Acuity in Senility: Including Discussion of Case of Endothelial Dystrophy as Cause of Bullous Keratitis by F. H. Verhoeff. R. I. Lloyd.—p. 232.
Cancer of Eyelid. L. Hollander and F. J. Krugh.—p. 244.
Recession of Inferior Oblique Muscle from External Rectus Approach. G. P. Guibor.—p. 254.
Transscleral Lacrimal Canaliculus Transplants. G. G. Gibson.—p. 258.
Test Charts Representing a Variety of Visual Tasks. M. Luckiesh.—p. 270.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

51:267-406 (March) 1944

Demonstration of Pulmonary Lobes and Interlobar Fissures by Roentgenograms of Artificial Thorax. E. M. Medlar, G. S. Pesquera, W. H. Ordway and E. C. Lasher.—p. 267.
*Roentgenographic Manifestations of Atypical Pneumonia of Unknown Etiology. W. E. Crysler.—p. 280.
Plea for Prevention of Bronchiectasis. K. Kornblum.—p. 292.
Pulmonary and Osseous Manifestations of Tuberous Sclerosis, with Some Remarks on Their Pathogenesis. A. J. Ackermann.—p. 315.
New Cholecystographic Preparation. H. C. Ochsner.—p. 326.
Cholecystographic Studies with Priodax. M. Dannenberg.—p. 328.
Calcifications of Spleen. E. F. Gray.—p. 336.
*Congenital Absence of Patellae Associated with Arthrodysplasia of Elbows and Dystrophy of Nails: Hereditary Syndrome. H. R. Senturia and B. D. Senturia.—p. 352.
Osseous Abnormalities of Thoracic Cage Seen in Forty Thousand Consecutive Chest Photoroentgenograms. L. E. Etter.—p. 359.
*Rationale and Results of Roentgen Treatment of Adrenal Glands in Angina Pectoris. W. Raab and A. B. Soule Jr.—p. 364.

Roentgenographic Manifestations of Atypical Pneumonia.—Crysler reports 178 cases of bronchopneumonia occurring in the personnel of the Royal Canadian Navy, demonstrated by roentgenographic examination. The majority of the patients had admission and progress roentgenograms. Roentgen examination revealed parenchymal infiltration the extent of which did not coincide with the severity of the symptoms and was located predominantly in the lower lobes. Localization in one lobe was observed in the great majority of the cases. The appearance of the infiltration was either transparent and homogeneous, flocculent, or a combination of these, occasionally associated with hilus prominence. This classification coincides with Scadding's "benign circumscribed" and "disseminated focal" types. When located in an upper lung field the disseminated focal infiltrations resembled pulmonary tuberculosis of the confluent flocculent type. The use of the lateral projection has been of value. When one considers the volume of lung parenchyma located below the summit of the diaphragm and behind the heart which is not visible in the posteroanterior projection, the value of the lateral roentgenogram becomes apparent. Elevation of a hemidiaphragm in conjunction with a basal lesion has been encountered more frequently than in reports of others. While it is recognized that the finding may be due to a lack of elasticity incident to the coexistent inflammatory changes, a lobular or partial atelectasis seems more appropriate. In a certain number of cases plugging of bronchioles with resulting atelectasis takes place. Resolution is the rule, leaving no sign of the previous infiltration and occurring on the average within two weeks. Nonresolution with clinical evidence of asthma has also been observed.

Absence of Patellas with Arthrodysplasia of Elbows and Dystrophy of Nails.—The Senturias report the association of malformations of the nails, hypoplasia or complete absence of the patellas and deformities with impaired function of the elbows. They review the literature on this triad and describe their observations on a man aged 36 with this triad. The genealogical tree of the patient shows that a total of 30 persons were affected in four generations. The triad is an inherited congenital developmental defect involving the ectodermal and mesodermal layers of the embryo. It is transmitted as a hereditary dominant character and is not sex linked.

Roentgen Treatment of Adrenals in Angina Pectoris.—Raab and Soule present clinical and experimental evidence for Raab's theory that anginal attacks are brought about by the acutely anoxiating effects of epinephrine discharges on a heart muscle whose coronary arteries are sclerotic and thus unfit for adequate compensatory dilatation. The state of abnormal irritability of the adrenal secretory mechanism which was found to be a characteristic of angina patients could be abolished through roentgen irradiation of the adrenal region without ensuing damage to the basic normal function of the glands. This was demonstrated objectively by quantitative chemical hormone determinations in the blood before and after treatment and by the normalization of pathologic electrocardiograms. Of 42 typical angina patients treated in Burlington, Vt., with irradiation of the adrenal region, 74 per cent were either completely freed from their anginal complaints or at least improved for periods ranging between five and forty-five months, with an

average of two years up to the present. Nine of the 11 unimproved patients had not received three series of roentgen treatments and thus cannot be considered as definite failures. No untoward side effects were noted except short episodes of nausea in a few cases. Death occurred in 7 of the 42 patients treated during the past four and one-half years.

Annals of Otol., Rhin. and Laryngology, St. Louis

53:1-204 (March) 1944. **Partial Index**

Otitis Externa. W. H. Johnston.—p. 5.
*Relationship of Poliomyelitis and Tonsillectomy. R. E. Howard.—p. 15.
Physiology of Drainage of Nasal Mucus: IV. Drainage of Accessory Sinuses in Man: Rationale of Irrigation of Infected Maxillary Sinuses. A. C. Hilding.—p. 35.
Recurrent Swelling of Parotid and Submaxillary Glands Following Bronchoscopy. R. W. Blackford.—p. 54.
Our Changing Conception of Acute Laryngotracheobronchitis. P. B. MacCready.—p. 65.
Significance of Eosinophilia in Rhinology. D. Miller.—p. 74.
Functional Anatomy of Skull: Anatomic Factors in Craniocerebral Injuries. S. L. Ruskin.—p. 81.
Extranasal Block Anesthesia for Submucous Resection of Nasal Septum. G. B. Fred.—p. 127.
Otolaryngologic Aspects of Bromide and Acetanilid Therapy. W. W. Eagle.—p. 133.
General Anesthesia for Total Laryngectomy. G. F. Browne.—p. 140.
Genetic Principles and Inheritance of Deaf-Mutism. J. M. Odiorne. —p. 153.
Elimination of Intranasal Pack by Topical Use of Thrombin. H. N. Stevenson.—p. 159.

Relationship of Poliomyelitis and Tonsillectomy.—Howard computes the incidence of poliomyelitis following tonsillectomy during the seven year period from 1937 to 1943, when 36,295 tonsil operations were performed in the hospitals of Cincinnati. About two thirds of these tonsil operations were performed on children of an age most susceptible to poliomyelitis. There were 257 cases of poliomyelitis in Cincinnati hospitals during the years reviewed. The cases occurred chiefly during the months from July to November. Only 6 of these cases of poliomyelitis developed following recent tonsillectomies. Three of these cases were of the spinal and 3 of the bulbar type, 1 of the latter being fatal. Investigations on the relationship of poliomyelitis to tonsillectomy and adenoidectomy should be based on the number of such operations performed during these months when the virus may be present either in the throat at the time of operation or afterward. The possibility of poliomyelitis during July, August, September and October in nonepidemic years following tonsillectomy and adenoidectomy is minimal, but when it does occur it is serious and most often bulbar in type. The ratio in the material reviewed by the author was 1 in 2,000 operations. The possibility of poliomyelitis following tonsillectomy and adenoidectomy in the other eight months is nil except in Texas and California, where the poliomyelitis season is extended from June to November and sometimes includes December. Operations on the nose and throat should be avoided whenever possible during months and years when there are epidemics of poliomyelitis.

Archives of Dermatology and Syphilology, Chicago

49:157-226 (March) 1944

Xeroderma Pigmentosum: Report of Case and Consideration of Incomplete Sex Linkage in Inheritance of Disease. Madge Thurlow Macklin.—p. 157.
Generalized Mercurial (Cinnabar) Reaction Following Tattooing. F. G. Novy Jr.—p. 172.
Lessened Sensitivity to Tuberculin in Acne. F. W. Lynch.—p. 174.
Neutralization as Therapeutic Principle in Contact Dermatitis. N. P. Anderson.—p. 176.
*Contact Eczema Due to Nail Polish. W. L. Dobes and P. H. Nippert. —p. 183.
Clinical Observations on Use of Soaps Containing an Abrasive. R. L. Kile and A. L. Welsh.—p. 188.
Nevus Striatus Symmetricus Unguis: Report of Case with Involvement of Thumbs and Little Fingers. E. A. Oliver and S. M. Bluefarb. —p. 190.
Dermatitis Due to Shoes. C. Shaw.—p. 191.
American (Mucocutaneous) Leishmaniasis: Observations. O. G. Costa.—p. 194.

Contact Eczema Due to Nail Polish.—According to Dobes and Nippert nail polish is one of the most frequent causes of dermatitis of the eyelids in women. One or both upper eyelids are usually involved. Persons acquire the habit of rubbing their eyelids with the backs of their hands and with their nails. The habits of resting the chin on flexed fingers, biting the nails and probing the nares and the ears with the finger tips result in patches of dermatitis in the areas where the nails touch the skin. The sides of the neck usually show a more diffuse dermatitis. Contact is made by readjusting the collar or dress. The eruption may appear on almost any part of the body where contact with nail lacquer is made. The authors report observations on 90 patients. The dermatitis produced by nail polish consists of a low grade erythema and scaling. Eight per cent of the patients showed vesiculation and weeping, especially when the chin and perioral areas were involved. Young high school girls who have a habit of biting their nails may present a picture which at first suggests a cheilitis from lipstick or toothpaste. The authors describe 7 typical cases, reproduce photographs of a number of lesions, review the literature and describe patch tests. The great majority of patients will give a positive reaction to patch tests. A few patients seem to have a localized hypersensitivity and do not react to the patches on the back or on the forearms. In testing such patients, one should apply the nail polish directly over the sensitized areas. Recurrence of the dermatitis when wearing of the nail polish is resumed is sufficient proof. Plasticizers, solvents and any other ingredients apparently can be the offending agents. The patient who insists on wearing nail polish should be tested with several brands of both colored and colorless polish. Most likely some brand and kind will be found that the patient will tolerate.

Archives of Surgery, Chicago

48:185-266 (March) 1944

Vitamin B_1 Nutrition in Surgical Patients as Determined by Blood Level of Pyruvic Acid: I. Hepatic Disease. H. A. Davis and F. K. Bauer.—p. 185.
Id.: II. Thyroid Disease. H. A. Davis and F. K. Bauer.—p. 190.
Id.: III. Renal Disease, Neoplastic Disease and Infection. H. A. Davis and F. K. Bauer.—p. 193.
Two Stage Operation for Carcinoma of Transverse Colon Producing Duodenocolic Fistula: Report of 2 Cases. R. R. Linton.—p. 197.
Mediastinal Ganglioneuroma. H. K. Gray, D. V. Shepard and M. B. Dockerty.—p. 208.
*Progressive Exophthalmos in Toxic Disease of Thyroid Gland: Review of Recent Literature, with Report of Case of Progressive Post-Thyroidectomy Proptosis in 6 Year Old Negro Girl. G. M. Haik. —p. 214.
Lateral Aberrant Thyroid: Metastasis to Lymph Nodes from Primary Carcinoma of Thyroid Gland. R. C. Clay and S. S. Blackman Jr. —p. 223.

Progressive Exophthalmos.—Haik states that treatment of exophthalmos associated with hyperthyroidism, particularly of the variety which becomes progressive after thyroidectomy, has been unsatisfactory. Thyroidectomy frequently seems to aggravate it. Recent studies indicate that the cause of exophthalmos in hyperthyroidism is local edema, sometimes associated with hypertrophy of the extraocular muscles. The author reports progressive post-thyroidectomy exophthalmos which he observed in a Negro girl aged 6. The case is of interest because toxic thyroid disease in very young children is unusual and is even more unusual in young Negro children. The character of this patient's toxicity was evidenced by her extreme nervousness, her voracious appetite with continued loss of weight, her constantly elevated pulse rate, respiratory rate and temperature, the crises which developed on two occasions and the degree of damage to the liver demonstrated ante mortem by serial function tests and confirmed by postmortem examination. The child's parents disregarded instructions given them when she was dismissed after the first operation. Ten months later irreparable damage to the eyes had occurred. The optic tissues removed at Naffziger's unroofing operation showed edematous changes, which were also present, though to a lesser degree, in the tissues removed post mortem. The case seems to fit into the "special ophthalmic type" of goiter described by Means and his associates. It may be that the use of irradiation rather than thyroidectomy might have saved the child's eyes and ultimately her life. It is reasoned that with a less abrupt alteration in the endocrine balance induced by irradiation there is a greater chance for more gradual readjustment of the optic structures.

Arkansas Medical Society Journal, Fort Smith

40:171-192 (March) 1944

Perforated Peptic Ulcer and Complications: Report of 4 Cases. M. B. Bowman.—p. 171.

40:193-212 (April) 1944

Problem of Tuberculosis in Mental Hospitals. A. C. Kolb.—p. 194.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

75:1-122 (April) 1944

Effect of Prolonged Wet and Cold on Extremities. R. H. Patterson. —p. 62.
Simple Tests of Nerve Trunk Injuries. R. G. Spurling and D. D. Matson.—p. 71.
Prophylactic Psychiatry in the Army. S. H. Kraines.—p. 77.
Fractures of Jaws. A. M. Maris.—p. 81.
Rehabilitation Program at Lawson General Hospital. N. E. Titus. —p. 88.
Emergency Barge Made with Aid Station Equipment. C. S. Shuman. —p. 93.
Mosquito Transmission of Venezuelan Virus Equine Encephalomyelitis in Trinidad. R. T. Gilyard.—p. 96.
New Technic of Prophylaxis in Venereal Disease. T. G. Tousey, E. J. Richter, C. Glazer and H. Abramson.—p. 108.
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Self-Retaining Traction for Use in Amputations. C. N. Pease.—p. 115.
Dental Infection and Urticaria. C. G. Emerson.—p. 116.

Canadian Journal of Public Health, Toronto

35:99-136 (March) 1944

Integration of Preventive and Curative Medicine in Health Insurance: I. D. S. Lewis.—p. 99.
Integration of Preventive and Curative Medicine in Health Insurance: II. F. W. Jackson.—p. 104.
Recent Advances in Tuberculosis Control. R. G. Ferguson.—p. 109.
Recent Advances in Child Hygiene. R. R. Struthers.—p. 113.
Population Changes Revealed by 1941 Census. O. A. Lemieux.—p. 120.
Infant Welfare Service in Lamont Health District. H. Siemens.—p. 132.

Journal of Allergy, St. Louis

15:77-162 (March) 1944

Hypersensitiveness of Mucous Membrane: IV. Effect of Local Reactions Elicited by Specific and Nonspecific Excitants on Ophthalmic Mucous Membrane in Allergic and Nonallergic Individuals. H. Sherman and L. Feldman.—p. 77.
Quantitative Method for Measurement of Precipitin Reactions. M. C. Johnson, H. L. Alexander, R. Robinson and J. H. Alexander.—p. 83.
Blood Studies in Allergy: I. Direct Counting Chamber Determination of Eosinophils by Propylene Glycol Aqueous Stains. T. G. Randolph. —p. 89.
Weather and Death in Asthma. W. F. Petersen and W. T. Vaughan. —p. 97.
*Relationship of Bronchial Asthma (and Hay Fever) to Pulmonary Tuberculosis. A. M. Tocker and A. G. Davidson.—p. 108.
Association Between Red-Green Color Blindness and Some Cases of Asthma and Hay Fever. H. B. Molholm.—p. 120.
Pollen Studies of Phoenix Area. H. Randolph and Margaret McNeil. —p. 125.
Pollen Content of Air in Rio de Janeiro, Brazil. J. B. Greco and A. O. Lima.—p. 138.
Administration of Nicotinic Acid and Calcium Lactate in Urticaria. Dorris Coss Chambers and H. S. Bernton.—p. 141.
Histaminic Cephalgia: Report of Case. L. W. Swanson.—p. 144.
Allergy to Odor of White Potato (Irish Potato). A. J. Horesh.—p. 147.
Vitamin B_1 Hypersensitivity with Desensitization: Report of Case. M. M. Mitrani.—p. 150.

Relationship of Bronchial Asthma to Pulmonary Tuberculosis.—Tocker and Davidson direct attention to the great divergences of opinion concerning the coexistence of pulmonary tuberculosis and bronchial asthma. Statistics have usually been obtained either by studying the incidence of tuberculosis among patients with bronchial asthma or by studying the incidence of bronchial asthma among patients with active pulmonary tuberculosis. The authors present their observations on patients hospitalized for active tuberculosis. Failure to differentiate between true bronchial asthma and asthmatoid symptoms caused by intrapulmonary lesions was undoubtedly responsible for the wide variations in the findings of earlier investigators. Tuberculous mediastinal lymph nodes, chronic bronchitis, pulmonary emphysema, bronchiectasis, displacement of the mediastinum and trachea, neoplasm, foreign bodies and particularly tracheobronchial tuberculosis may produce asthma-like symptoms. Before the era of the roentgen rays the underlying pulmonary pathologic condition was frequently missed, so that conditions causing asthmatoid symptoms were commonly diagnosed as bronchial asthma. Today this problem is partly solved by the application of such criteria as a positive family or personal history of atopy, positive cutaneous reactions to common allergens, an excess of eosinophils in the sputum, a favorable clinical response to epinephrine and a characteristic symptomatology and clinical course. The authors made their studies on 386 adult patients with active pulmonary tuberculosis at Sea View Hospital in New York City. They found that 12, or 3.1 per cent, presented a past or present history of bronchial asthma, and 11, or 2.8 per cent, a history of hay fever. These figures approximate the incidence of these illnesses in the normal population. Of the 11 cases with hay fever only 2, or 18 per cent, gave a history of asthma; this did not exceed the anticipated incidence. These findings refute the reports of earlier writers that (*a*) tuberculosis and asthma are mutually exclusive, (*b*) tuberculosis predisposes to asthma and (*c*) there is a common, specific form of asthma based on an allergy to the tubercle bacillus. The allergens producing bronchial asthma in patients with tuberculosis are the same as those producing asthma among the nontuberculous. The effectiveness of skin testing with these allergens, however, may be impaired as a result of diminished cutaneous reactivity in such cases. Asthmatic symptoms tend to improve with activity of a tuberculous process and to recur with the healing of the infection. Asthmatic seizures are a potential source of danger to the favorable course of tuberculosis.

Journal-Lancet, Minneapolis

64:35-66 (Feb.) 1944

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Celiac Syndrome in Children. R. E. Dyson.—p. 40.
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64:67-94 (March) 1944

Tuberculosis Among Children of Preschool Age. F. E. Torres, J. A. Myers and F. E. Harrington.—p. 67.
Abdominal Pregnancy: Case Report. J. D. Graham.—p. 78.
Treatment of Eye Diseases by General Practitioner. W. M. Bane.—p. 80.
Walter Reed in Minnesota. Bertha L. Heilbron.—p. 82.

Journal of Urology, Baltimore

51:235-332 (March) 1944

Adenomyosarcoma of Kidney in Adult (Wilms's Tumor): Report of Case. D. A. Wood.—p. 235.
*Carcinoma of Renal Pelvis: Histopathologic Study of 75 Cases, with Special Reference to Prognosis. J. R. McDonald and J. T. Priestley. —p. 245.
Quantitative Microchemical and Spectrographic Data on Renal Calculi and Their Relation to Infection. H. E. Thompson, L. T. Steadman, J. A. Benjamin and W. W. Scott.—p. 259.
Focal Embolic Glomerulonephritis, Nonsuppurative: Case Report. C. Ferguson.—p. 272.
Tuberculoma of Kidney: Report of Case. S. L. Wang and A. V. Flaqué.—p. 275.
Renal Rickets Syndrome. W. G. Hayward.—p. 278.
Duodenal Fistula After Kidney Surgery: Case Report. D. H. Schneider. —p. 287.
Tumors of Testis Following Mumps Orchitis: Case Report and Review of 24 Cases. J. B. Gilbert.—p. 296.
Operative Technic for Cryptorchism. R. H. Abrahamson.—p. 301.
Bacillus Welchi Infections Complicating Surgical Procedures on Upper Urinary Tract. J. A. Lazarus.—p. 315.
Observations of Action of Koagamin. W. P. Herbst and J. J. Weinstein.—p. 325.
Army General Hospital. F. C. Hamm.—p. 329.

Carcinoma of Renal Pelvis.—McDonald and Priestley review observations on kidneys which were surgically removed at the Mayo Clinic between 1904 and 1940. Kidneys in which the artery and vein could not be identified were discarded. Seventy-five specimens of carcinoma of the renal pelvis were used in this investigation. While most observers divided these neoplasms into papillary and nonpapillary types, the authors suggest a workable classification, dividing them into three groups: (1) papillary, (2) papillary with infiltration and (3) infiltrative. This classification, the involvement of the main renal vein and its tributaries or of the perineural lymphatics, and the histologic grade of the neoplasm would appear to be three important factors in ascertaining a more adequate prognosis for patients following surgical removal of a carcinoma of the renal pelvis. As the best treatment for these neoplasms the authors suggest nephrectomy with removal of the upper

third of the ureter in the infiltrating group of carcinomas, while nephroureterectomy with removal of a cuff of the bladder around the corresponding ureteral orifice is advisable in the papillary types, whether infiltration is or is not present.

Medicine, Baltimore

23:1-104 (Feb.) 1944

Secondary Pellagra. W. B. Bean, T. D. Spies and M. A. Blankenhorn. —p. 1.
Acridine Antiseptics: Review. G. J. Martin.—p. 79.

Minnesota Medicine, St. Paul

27:241-336 (April) 1944

*Posterior Herniation of Intervertebral Disk: Analysis of 65 Cases. W. T. Peyton and J. D. Levin.—p. 263.
*Torsion of Uterus. C. C. Bell.—p. 274.
Traumatic Rupture of Intestine. A. N. Collins.—p. 276.
Desmoid Tumor. D. B. Judd and J. C. Masson.—p. 279.
Present Status of Intravenous and Retrograde Pyelography. W. E. Hatch.—p. 281.

Posterior Herniation of Intervertebral Disk.—Peyton and Levin present a follow-up analysis of 65 patients with herniated disk of the lumbar spine treated by operation at the University of Minnesota Hospitals. The maximal period of follow-up was five and one-half years, the minimal period eighteen months. Complete relief was obtained in approximately two thirds of the patients and improvement in an additional 16 per cent. Backache, which was present in every case before operation, was completely obviated in approximately 70 per cent of the cases and relieved to a great extent in an additional 20 per cent. The sciatic syndrome, or evidence of root irritation, present in 96 per cent of cases before operation, was present in 27.5 per cent of cases after the operation. Similarly, the aggravation of pain with coughing and sneezing that was present in 88.7 per cent of cases before operation was present in 23 per cent at follow-up examinations. The lumbar curve was restored in 34 per cent. Muscle spasm was relieved in 71 per cent, which is approximately the same number that were relieved of the symptoms of root pain. Sciatic tenderness was eliminated in 86 per cent and scoliosis in 99 per cent of those having it. Straight leg raising was restored to normal in 65 per cent. Sensory disturbances were altered but little by the surgical procedure; they were improved in 6.2 per cent, indicating that damage due to compression of the rootlets is irreversible in many instances. Atrophy was unaltered by surgery.

Torsion of Uterus.—Authors who have reported cases of torsion of the uterus are fairly well agreed on the etiology. The predisposing causes most favored are pelvic tumors, adhesions, laxity of the supporting ligaments and abdominal wall, and a soft, thin walled lower uterine segment. A large asymmetrical uterine fibroid is commonly a predisposing factor. The most favored activating factor is a sudden twist or turn of the body, such as suddenly turning over in bed. The twisting motion of sweeping or scrubbing a floor or operating a hand scythe, all of which require a swinging motion of the body, are felt by many authors to be etiologic factors. The initial symptoms are due to injury to the structures in the pedicle, which sets up secondary changes and later leads to involvement of the surrounding organs. The structures affected are the cervix, ganglions and nerves, uterus, broad ligaments, bladder and rectum. The usual symptoms are the sudden onset of severe, acute, generalized abdominal pain accompanied by nausea or vomiting and soon followed by shock. There is no single characteristic symptom on which to base a diagnosis. The author's patient, aged 31, developed obscure abdominal symptoms in her fifth month of pregnancy. Exploratory laparotomy disclosed that the uterus had rotated to the right through 180 degrees. The left fallopian tube and broad ligament were stretched across the posterior surface of the uterus, which was directed anteriorly. The uterus was tense, but there was a suggestion of loss in normal consistency. It was rotated back into normal position, and continuous hot wet packs were applied for a time, but since there was no change in its appearance a supravaginal hysterectomy was done. Some writers claim to have reduced uterine torsion by manipulation. Most authors, however, agree that such a procedure should be reserved for mild cases in early pregnancy. In frank torsion, with severe symptoms, nothing short of operation should be considered. Operation should not even be delayed for temporary antishock measures, since the initial shock soon merges into progressive collapse as the vascular and nervous damage becomes more pronounced. At operation it may seem advisable simply to reduce the torsion if all tissues are in normal condition and there is no pelvic abnormality which makes recurrence probable. If circulation has been long obstructed it is necessary to remove all devitalized tissue.

Missouri State Medical Assn. Journal, St. Louis

41:49-68 (March) 1944

Present Status of Cancer of Colon and Rectum. E. D. Sugarbaker. —p. 49.
Unusual Case of Arsenical Dermatitis: Report of Case. E. P. Monahan.—p. 54.
Original Pressure Point Technic for Insertion of Caudal Needle. J. R. Compton.—p. 61.

41:69-90 (April) 1944

Poliomyelitis. L. R. Jones.—p. 69.
Treatment of Infantile Paralysis. J. A. Key.—p. 70.
Poliomyelitis. D. Walthall.—p. 73.

New England Journal of Medicine, Boston

230:339-368 (March 23) 1944

Therapy with Female Sex Hormones. G. V. S. Smith.—p. 339.
Methods of Diagnosis of Jaundice. F. W. White.—p. 344.
Therapeutic Value of Two New Sulfonamide Compounds, Succinylsulfathiazole and Phthalylsulfathiazole, in Experimental Trichinosis. D. L. Augustine.—p. 349.
Malaria in Massachusetts. V. A. Getting.—p. 350.

230:369-418 (March 30) 1944

*Clinical Evaluation of Sulfamerazine. D. G. Anderson, C. S. Oliver and C. S. Keefer.—p. 369.
Encapsulated Pleural Effusion Due to Heart Failure: Report of 2 Cases. A. H. Russakoff and T. Weinberg.—p. 379.
Psychiatry. V. P. Williams.—p. 382.

Clinical Evaluation of Sulfamerazine.—Anderson and his associates administered sulfamerazine to 278 patients with bacterial infections, such as the various types of pneumonia and of meningitis, erysipelas and infections of urinary tract and of the ear and throat. Sulfamerazine exhibited a therapeutic efficiency similar to that of sulfadiazine in the treatment of pneumococcic pneumonia, meningococcic meningitis and erysipelas. Sulfamerazine was clinically effective in total doses that were on the average one half to one third smaller than the amounts of sulfadiazine usually administered for similar conditions. Toxic reactions to sulfamerazine were in general of the same character and occurred with about the same frequency as those caused by sulfadiazine. Two exceptions should be made to this statement: Sulfamerazine has a greater tendency to cause leukopenia than has sulfadiazine and the incidence of drug rash and drug fever may be somewhat higher. Sulfamerazine is a potent chemotherapeutic agent and a valuable addition to the sulfonamide derivatives already in general use.

Northwest Medicine, Seattle

43:31-64 (Feb.) 1944

Pathogenesis of Peptic Ulcer. J. S. Sweeney.—p. 36.
Peptic Ulcer in Children: Case Report of Perforation. L. R. Hutchins.—p. 40.
Epidemic Meningitis. I. R. Juster.—p. 42.
Electric Shock Therapy: Report from 100 Private Cases. N. K. Rickles.—p. 44.

43:65-96 (March) 1944

Bacillary and Amebic Dysentery. W. L. Voegtlin.—p. 69.
Hypertensive Disease in Unilateral Kidney Pathology Relieved by Nephrectomy. J. H. Besson.—p. 73.
Gangrene in Diabetes Mellitus. L. J. Palmer, C. A. Mangham and P. Booth.—p. 75.
Blood in Stool in Infants and Children. M. S. Rosenblatt.—p. 78.
Metastasizing Intracranial Tumors. W. B. Dublin.—p. 83.

Public Health Reports, Washington, D. C.

59:281-316 (March 3) 1944

Location and Movement of Physicians—Methods for Estimating Physician Resources. E. H. Pennell.—p. 281.

Radiology, Syracuse, N. Y.

42:213-318 (March) 1944

Roentgen Diagnosis of Bronchiogenic Carcinoma. H. L. Shinall.—p. 213.
Carcinoma of Esophagus in Association with Achalasia of Cardia. S. R. Bersack.—p. 220.
New Gallbladder Contrast Medium: Priodax. L. Bryan and N. S. Pedersen.—p. 224.
Oral Cholecystography: Comparative Study of Single and Divided Dose Method with Contrast Media in Liquid and Solid Form. L. W. Paul, E. A. Pohle and R. R. Benson.—p. 226.
*Cholecystography with Priodax: Report of 600 Examinations. H. W. Hefke.—p. 233.
Baker's Cyst: Posterior Herniation of Knee Joint. H. H. Kuhn and J. E. Hemphill.—p. 237.
Low Voltage Contact Radiation Therapy: Further Experience. L. S. Goin.—p. 241.
Treatment of Osteogenic Sarcoma with Preoperative Roentgen Radiation in Large Doses. R. F. McNattin.—p. 246.
Theories on Effectiveness of Roentgen Therapy in Inflammatory Conditions. J. Borak.—p. 249.
Roentgen Therapy with Low Dosage in Suppurative Infections. H. H. Pool.—p. 255.
Depth Dose Measurements for 100, 120 and 135 Kilovolt Roentgen Rays. C. B. Braestrup.—p. 258.
Regenerative Processes Induced by Gonadotropic Hormones in Irradiated Testes of Albino Rat. E. Momigliano and J. M. Essenberg.—p. 273.

Cholecystography with Priodax.—Hefke used β-(4-hydroxy-3, 5-diiodophenyl)-α-phenylpropionic acid, which is also known as priodax, in 600 gallbladder examinations. Administered in tablet form, a total of 3 Gm. of the active substance constitutes the usual dose. A fat free supper is eaten at 6 p. m. No preliminary laxative or diet is given. Immediately after supper the tablets are swallowed, whole or crushed, with water or fruit juice. The patient is told not to chew them because of the unpleasant burning and bitter taste. Following this the patient abstains from food (except water or fruit juices) until the examination is completed the following morning. A cleansing enema in the morning is advised. The author found that priodax is a reliable contrast material for cholecystography. No evidence of harmful effects was observed in 600 cases. Nausea, vomiting and diarrhea are considerably less than with tetraiodophenolphthalein. Diagnostic accuracy is as great as that achieved with tetraiodophenolphthalein, and in some respects (particularly in cases of a nonfunctioning gallbladder) priodax seems to be more reliable.

Rhode Island Medical Journal, Providence

27:101-152 (March) 1944

Acute Respiratory Diseases. A. M. Burgess.—p. 109.
Sulfonamides in Treatment of Common Diseases of Upper Respiratory Tract. K. K. Gregory.—p. 111.
Sulfonamide Treatment of Respiratory Diseases in Childhood. H. E. Utter.—p. 113.
Chemotherapy of Pneumonia. R. O. Bowman.—p. 116.

Southern Medical Journal, Birmingham, Ala.

37:123-186 (March) 1944

*Morton's Metatarsalgia: Localized Degenerative Fibrosis with Neuromatous Proliferation of Fourth Plantar Nerve. L. D. Baker and H. H. Kuhn.—p. 123.
Revised Technic for Treatment of Empyema. E. J. McGrath.—p. 127.
Glandular Metaplasia of Epithelium of Urinary Tract. N. C. Foot.—p. 137.
Pneumoencephalography in Study of Sequelae of Head Injuries. F. H. Mayfield and J. C. Bell.—p. 142.
Implant Material: Production of Fibrous Tissue Around Fibers of Cotton and Other Foreign Material Implanted Subcutaneously in Rats. H. B. Searcy, E. B. Carmichael and M. C. Wheelock.—p. 149.
Role of Penicillin in Treatment of Bacterial Infections. W. E. Herrell.—p. 150.
Acute Infections of Hand. S. L. Koch.—p. 157.
Bradycardia in Children Under Ether Anesthesia. H. C. Slocum and C. R. Allen.—p. 159.
Premature Separation of Placenta. H. H. Ware Jr., W. C. Winn and E. C. Schelin.—p. 163.
Post-Thyroidectomy Laryngeal Paralysis (Bilateral): Medical and Surgical Aspects. P. H. Holinger.—p. 169.
Dermatologic Problems in General Practice. P. A. O'Leary.—p. 175.
Health Problems Ahead. T. Parran.—p. 179.

Morton's Metatarsalgia.—Baker and Kuhn report 14 operations for removal of tumors of the fourth plantar digital nerve to confirm the operative results reported by Betts and by McElvenny in patients with Morton's metatarsalgia. They show that Morton's hypotheses have been disproved by the works of Betts and of McElvenny and by the cases herein reported, as the tumors have been found to lie in the web space between the third and fourth toes. The authors emphasize that Morton's metatarsalgia syndrome is caused by a tumor in the fourth plantar digital nerve. The cause of this lesion is undetermined, but the anatomic relationships of the nerve and the pathologic findings indicate that it is a degenerative fibrosis of the nerve with neuromatous proliferation resulting from or irritated by repeated trauma. The characteristic history of the syndrome and the presence of a localized tenderness to deep palpation in the third web space or between the third and fourth metatarsal heads on the dorsal surface of the foot make the diagnosis simple. Excision of the tumor relieves the symptoms.

Surgery, St. Louis

15:367-520 (March) 1944

Anterior Resection for Carcinoma Low in Sigmoid and Rectosigmoid. C. F. Dixon.—p. 367.
Fixation of Skin Grafts by Thrombinplasma Adhesion. F. Young and B. V. Favata.—p. 378.
*Notes on Diagnosis of Herniated Nucleus Pulposus in Lower Lumbar Region. R. G. Spurling and T. C. Thompson.—p. 387.
Use of Phlebography and Lumbar Sympathetic Block in Diagnosis of Venospasm of Lower Extremities: Preliminary Report. E. M. Papper and A. E. Imler.—p. 402.
*Lesions of Breast: Relationship of Benign Lesions to Carcinoma. O. T. Clagett, N. C. Plimpton and G. T. Root.—p. 413.
*Studies on Traumatic Shock: II. Restoration of Blood Volume in Traumatic Shock. E. I. Evans ,G. W. Janes III and M. J. Hoover.—p. 420.
Cardiopulmonary Disturbances Associated with Mediastinal Displacement After Pneumonectomy. H. C. Maier.—p. 432.
Roentgenographic Diagnosis of Torsional Deformities in Tubular Bones. H. Milch.—p. 440.
Derma-Fat-Fascia Transplants Used in Building Up Breasts. M. I. Berson.—p. 451.
Improved Cutting Edge for Padgett Dermatome. H. B. Shumacker Jr.—p. 457.
Observations on Intracisternal Injection of Potassium Phosphate in Dog. E. A. Smolik.—p. 460.
Traumatic Perforations of Small Intestine Due to Nonpenetrating Abdominal Injuries: Survey of 18 Cases. B. J. Ficarra.—p. 465.
Spinal Anesthesia: Study of Safety Factors and Postoperative Pulmonary Complication in 1,344 Consecutive General Surgical Procedures on Naval Recruits. E. D. Babbage and C. W. McLaughlin Jr.—p. 476.
Sensitivity to Local Application of Sulfanilamide. L. J. Taubenhaus.—p. 483.
Amino Acids and Blood Clot Retraction. P. M. Aggeler and S. P. Lucia.—p. 486.

Diagnosis of Herniated Nucleus Pulposus.—Spurling and Thompson state that a pathologic condition of the disks is responsible for symptoms in only a small percentage of patients with lame backs. In almost every instance of traumatic lesions of the lumbar intervertebral disks the first symptom is backache. Bachache without radiation of pain into either leg is seldom caused by herniation of the nucleus pulposus. There may be one or more attacks of backache before the onset of sciatic pain. Where trauma produces gross injury to the intervertebral disk, the leg pain may occur simultaneously with the low back disability. Pain is usually present along the entire course of the sciatic nerve. Usually the sciatic pain remains unilateral, but there are instances of bilateral pain, and not infrequently the pain will shift from one leg to the other. Partial or complete remissions of symptoms occur characteristically in lumbar herniations of the nucleus pulposus. A patient with severe sciatic pain usually keeps the knee flexed; it is hard for him to get his heel to the floor. For this reason elevation of the heel of the shoe sometimes gives relief. Slight flexion of the knee and thigh gives relief of pain by relaxing the pull on the sciatic nerve. Any bending movement, sitting or exercising exaggerates the pain. In 60 per cent of lumbar herniations of the nucleus pulposus the diagnosis can be established accurately on clinical findings, but the remaining 40 per cent can be demonstrated only by exploratory operation or by myelography. A new myelographic medium, pantopaque, is now available which combines the desirable qualities of lipiodol and thorotrast and is more easily removed by aspiration. If a few drops are left, they are gradually absorbed.

Lesions of the Breast.—Clagett and his associates reviewed all the cases in which a benign condition of the breast was treated surgically at the Mayo Clinic during the years 1935 and 1936. The most common operative procedure used was local excision of the tumor. In some instances unilateral mastectomy and occasionally bilateral mastectomy had been done. An

attempt was made to trace 442 patients five to six years after surgical treatment at the clinic for benign lesions of the breast; 86.4 per cent were traced. Carcinoma of the breast subsequently developed in 7 cases, a crude attack rate of 1.8 per cent in the five to six year period. Carcinoma was not reported in any case of fibroadenoma or comedomastitis, but it did develop in the groups of patients who had chronic cystic mastitis (3.3 per cent) and chronic mastitis (1.6 per cent). The incidence of carcinoma of the breast in the entire series was five times as great as was the incidence of carcinoma of the breast in the population of women 25 to 65 years of age in Minnesota for the year 1940. Such findings emphasize the importance of following closely patients with cystic disease of the breast in order to observe any recurrence of a benign condition or a possible development of a malignant process.

Restoration of Blood Volume in Traumatic Shock.—Evans and his associates studied blood volume restoration in traumatic shock. One patient, after having recovered from the initial severe shock after treatment with one blood transfusion, on the third day had a normal blood pressure, slightly elevated pulse rate and no typical signs of shock. He was raised in bed to a better position for chest examination, when he suddenly died. Another shock patient similarly treated died shortly after he had been moved on his side for a spinal tap on the third day after admission. The authors were under the impression that the cause of death was probably a poor adjustment in the circulatory flow to the vital centers. They carried out a blood volume estimation at twenty-four hour intervals until the plasma volume had returned to normal levels. They observed that loss of blood or plasma in traumatic shock is associated with only a slow restoration of plasma volume. Three to four days may be required for the attainment of normal plasma volume levels. After shock, the plasma volume is not restored to normal until new plasma protein is drawn into the circulation. Plasma volume is not restored after shock by replacement with protein poor fluids withdrawn from the extravascular system. There are apparently no red cell reserves available for replenishment of red blood cells lost in traumatic shock either immediately or for three to four days after the injury. The proper therapy for traumatic shock after the emergency treatment with plasma requires the administration of adequate amounts of whole blood to replace red blood cells lost.

Tennessee State Medical Assn. Journal, Nashville

37:41-76 (Feb.) 1944

Shock. E. Haun.—p. 57.

37:77-112 (March) 1944

Traumatic Intussusception. L. A. Haun and E. Haun.—p. 77.
Malignant Granulosa Cell Tumor: Case Report. T. V. Banks.—p. 81.

Virginia Medical Monthly, Richmond

71:173-224 (April) 1944

Rehabilitation of Industrial Casualty. A. P. Aitken.—p. 177.
Curative Workshop. B. Greve.—p. 180.
Occupational Therapy in Tuberculosis Treatment. H. Hudson.—p. 183.
Role of Occupational Therapy in Mental Hospital. J. E. Barrett.—p. 186.
Occupational Therapist and Problems of Producing Her. Sue P. Hurt. —p. 188.
Role of Psychiatry in Alcoholism. R. V. Seliger and Victoria Cranford. —p. 191.
Tuberculosis of Vulva. R. Bates Jr. and M. P. Rucker.—p. 199.
Treatment of Pulmonary Tuberculosis by Artificial Pneumothorax. G. C. Godwin.—p. 203.
New Medical Practice Act. R. C. Duval Jr.—p. 205.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

52:87-138 (March) 1944

*Regeneration of Monkey Uterus After Surgical Removal of Endometrium and Accidental Endometriosis. C. G. Hartman.—p. 87.
*Clinical Significance of Rh Factor. P. A. Reynolds.—p. 103.
Clinical Observations and Surgical Experiences with Parotid Tumors. D. V. Trueblood.—p. 109.
Endocrine Theory Concerning Effects of Pituitary Hormones in Psychosis (Paranoia, Manic-Depressive Psychosis, Schizophrenia and Involution Melancholia): Case Report. S. Brock.—p. 119.
Postoperative Pulmonary Complications. F. F. Ham.—p. 129.

Regeneration of Monkey Uterus After Removal of Endometrium.—Hartman studied the regenerative power of the uterus following what he designates as hysterotomy rather than endometritectomy. In hysterotomy as practiced by the author, most of the endometrium is removed, including the basalis—not merely the functionalis, which alone is normally involved in parturition or in menstruation. In six experiments the endometrium was wiped out as clean as possible with a cotton sponge, so that no vestige of mucosa was visible to the naked eye. More than 200 hysterotomies have been performed on monkeys, but only 103 have been tabulated for this study. The condition of the uterus subsequent to the single or multiple hysterotomies was recorded in several ways: first, in experiments with hormones, at the end of which the organ was sectioned for microscopic examination; second, by comparing the condition of both uterus and embryo at the first operation with the uterus and the new embryo at a subsequent hysterotomy. The later reproductive performance of the animals was also recorded. All the data obtained seem to justify the conclusion that a healing and regeneration of the damaged and almost completely eliminated endometrium proceeds at a rapid rate. Two weeks sufficed in 1 case. On another occasion three weeks proved ample time for the regeneration of the uterine lining and its preparation for successful nidification of the monkey vesicle. This performance of the endometrium is all the more remarkable because from the bare remnants of the basalis alone, with its independent circulation, there differentiates the functionalis with its system of spiral arterioles whose physiologic control differs widely from that of the basal circulation. In all cases in which menstrual cycles were recorded after hysterotomy, the menstrual periods seemed to differ in no important detail from the untouched virgin organ. The described removal of endometrium might throw light on the development of endometriosis in that it is inevitable that bits of tissue be "spilled," i. e. dropped as seed into the body cavity. As is to be expected, the numerous cases of extrauterine takes of such seedings fully confirm the experiments of Jacobsen and others. Some of the regenerated bits of transplanted tissue increased greatly in size, occasionally closing up into a rounded mass with endometrium inside. Chocolate cysts were quite common. The endometrium in these masses could frequently be related to the stage of the cycle, paralleling the normal uterine mucosa in situ. These observations do not prove or disprove Sampson's theory of the pathogenesis of endometriosis.

Clinical Significance of Rh Factor.—According to Reynolds, the Rh factor is inherited as a mendelian dominant. The Rh positive father may be a heterozygote or a homozygote. The heterozyte father mated to an Rh negative wife has a 50 per cent chance of producing Rh positive babies with a high probability that they will be erythroblastotic, and a 50 per cent chance of producing Rh negative babies who will be normal. There does not yet exist a laboratory test to determine whether the father is a heterozygote. If among his offspring there are both Rh negative and Rh positive individuals, he can definitely be classified as a heterozygote. The author urges caution in offering too grave a prognosis to parents presenting the erythroblastotic Rh status, for it is seldom possible to designate an Rh positive father as a homozygote, and thus normal pregnancies may occur following repeated erythroblastosis. Early delivery of the baby, with possible consequent death from prematurity, is to be done only after careful instruction of the parents. For at present there is no way of determining definitely the presence of erythroblastosis in the unborn fetus. Transfusion should always be preceded by Rh determination. It is suggested that individual Rh determinations be made of the entire population. Women suffering repeated abortions should have their Rh status determined. Further study should be made of postpartum anemias which may be the result of a reversal of the Rh mechanism in the case of the Rh negative infant and the Rh positive mother. Treatment of the erythroblastotic infant might best be attempted by alternating Rh positive and Rh negative blood transfusions. Murietta suggested that a counter foreign protein antibody might be discovered which would eliminate the Rh antibodies.

Wisconsin Medical Journal, Madison

43:281-380 (March) 1944

Early Diagnosis of Cancer of Cervix. R. E. Campbell.—p. 301.
Role of Cervix in Sterility. R. A. Reis and E. A. Bernick.—p. 306.
Surgical Repair of Burns. F. McDowell and J. B. Brown.—p. 310.
Reducing Hazards During First Week of Life. J. W. Prentice.—p. 316.
Treatment of Compound Fractures. E. L. Compere.—p. 320.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Lancet, London

1:107-138 (Jan. 22) 1944

Endemic Goiter in England: Argument for Preventive Action. Memorandum of Goiter Subcommittee, Medical Research Council.—p. 107.
Forward Surgery in Battle Period. G. K. Harrison.—p. 109.
Intrapelvic Rupture of Urethra. B. C. Murless.—p. 111.
*Identity of Patulin and Claviformin. E. Chain, H. W. Florey, M. A. Jennings, with Note on Crystallography. D. Crowfoot and G. Low.—p. 112.
Removal of Ether Vapor During Anesthesia. H. G. Epstein.—p. 114.
*Sciatica: Study of 40 Cases. A. D. Le Vay.—p. 116.
Large Twins. L. M. Park.—p. 118.
*Prevention of Seasickness by Drugs. H. E. Holling, B. McArdle and W. R. Trotter.—p. 127.

Identity of Patulin and Claviformin.—The crystalline antibiotic from Penicillium claviforme is designated as claviformin. Chain and his collaborators point out that the formula $C_9 H_8 O_5$ was proposed for claviformin, but its molecular weight, which was determined by x-ray crystallographic records, indicated the formula $C_7 H_6 O_4$, which is the same as that of patulin. In view of the similarity between the chemical properties of claviformin and patulin, the mixed melting point of the two substances was determined. The mixture melted at between 109 and 110 C.—i. e., without any significant depression of the melting point of either substance. This strongly indicates the identity of patulin with claviformin. The final proof of the identity of the two substances has been obtained from crystallographic measurements. As regards biologic properties, identical results have been obtained with patulin and claviformin. Biologic tests show that the antibacterial activity is reduced by the presence of serum and that leukocytes are killed at concentrations smaller than those which are required to inhibit bacterial growth, confirming results previously published. Claviformin or patulin apparently has no advantage over more easily accessible antiseptics. Whether it is of value in the treatment of the common cold appears to depend on whether it possesses pharmacologic properties apart from its antibacterial activity or whether it has a viricidal action.

Sciatica.—Le Vay studied sciatica in 40 service men of an average age of 31 years. The physical signs were orthopedic and neurologic. According to the presence or absence of neurologic signs, two groups were differentiated. Neurologic symptoms occurred in 28 cases. In the 12 non-neurologic cases the average duration of symptoms was only twenty-two months, compared with thirty-four months in the neurologic group. The cases in which only orthopedic symptoms were present were in an earlier stage of development. If this is true, it should be possible occasionally to observe the transition. In 3 cases originally without neurologic features, these were observed to develop during a longish stay in the hospital. This and the similar clinical history encourage the belief that the only real difference between the two groups is one of clinical progress. Myelography or operation was felt to be justifiable only in the neurologic cases. The diagnosis was taken to the point of verification of disk prolapse only in 9 cases with neurologic signs. Four disks were operated on, and 5 were proved by myelography. All of these patients had the usual orthopedic signs. Disk prolapse need not be ruled out in the absence of neurologic changes when there are a suggestive history and an orthopedic state. In such cases there may be a place for air myelography and tomography to clinch a tentative diagnosis, and certain other features pointing to disk prolapse will be significant. Prolapsed disk is by far the commonest cause of sciatica in service patients.

Prevention of Seasickness by Drugs.—Holling and his co-workers attempted to develop a method of preventing seasickness in troops about to land on a hostile shore. All trials were conducted on the sea. Whenever there was a prospect of sufficiently rough weather, a party of about 70 soldiers was embarked on two motor minesweepers or trawlers. One hour before embarkation each man received either a dummy tablet or one of the drugs being tested. Some proprietary remedies available to travelers were tested, with no significant difference between the sickness rates in the treated and control groups. Other drugs found to be without appreciable effect were methedrine, which is similar to amphetamine, diphenylhydantoin sodium and the barbiturates hexobarbitone and phenobarbitone. Atropine, hyoscyamine and scopolamine were shown to have a significant effect on seasickness. These drugs belong to the belladonna group. Scopolamine caused a greater reduction in seasickness than did any other drug. The dose of scopolamine was either 0.6 or 1.2 mg. The only unpleasant side effect noticed with use of the larger dose of scopolamine was the occasional complaint that dryness of the mouth made mastication difficult. The men were not drowsy and did not complain of ocular symptoms. Further tests on men carrying out strenuous military exercise disclosed that scopolamine did not dangerously diminish sweating in men undergoing severe exertion. In a small series of experiments in which 2 subjects took exercise in a hot chamber, it was found that the sweat output was somewhat less and the rise in rectal temperature somewhat greater when scopolamine had been taken. The differences were, however, small and probably insufficient to be of practical importance.

Praxis, Bern

32:581-594 (Aug. 12) 1943

*Skin Lesions in Brucellosis. A. Schoch.—p. 581.
Treatment of Gonorrhea. H. Tecoz.—p. 585.

Skin Lesions in Brucellosis.—Ten per cent of all veterinarians in Switzerland acquired cutaneous lesions after obstetric interventions on animals infected with Brucella abortus. According to Schoch these lesions are due to an allergic reaction of the skin to contact with brucella organisms. Acute brucellosis does not need to be present, because cutaneous lesions were seen not only in persons who had had brucellosis but in some who never had it. If the exanthems do not accompany acute brucellosis, the general condition may be good; fever and swelling of lymph nodes may be absent. The most frequent cutaneous manifestations are papulopustular eruptions and eruptions which resemble exudative erythema multiforme. The individual crop of efflorescences is rarely monomorphic; usually several forms concur. The differential diagnosis is difficult. Attempts to culture the brucella organisms from cutaneous blisters may fail because pus organisms grow more rapidly and thus obscure the brucella organisms. Subcutaneous inoculation into guinea pigs may yield the organism. Brucellosis can be ascertained by cutaneous reaction. In the presence of suspicious cutaneous lesions in persons who have aided in the delivery of animals with Brucella abortus the cutaneous test is more reliable than the blood agglutination test. Vaccine has not proved effective in the treatment of cutaneous lesions of brucellosis. The author uses a sulfur-mercury mixture locally and a pyrazole derivative internally. Protection of hands and arms with oils or with rubber gloves and disinfection of hands are valuable prophylactic measures.

Pediatria e Puericultura, Bahia

12:35-102 (Dec.) 1942. **Partial Index**

*Treatment of Rickets with Massive Dose of Vitamin D. A. Bahia, A. Ribeiro, U. Freitas and G. Caldas.—p. 35.
Cardiazol (von Meduna) Therapy in Psychiatric Diseases in Children. P. Junior.—p. 75.

Treatment of Rickets with Massive Dose of Vitamin D.—Bahia and collaborators administered a massive dose (15 mg.) of vitamin D_2 by mouth or of vitamin D_3 intramuscularly to 20 infants with rickets. The state of nutrition of these infants rapidly improved. Craniotabes disappeared on an average in forty-five days. Roentgenograms of bones showed recalcification even in 2 tuberculous infants with acute nutritional dystrophy. The drug was well tolerated in all cases. There were no refractory cases. Gastrointestinal disorders and diseases of the respiratory tract disappeared. The patients appeared cured when observed four months after administration of the vitamin. Administration of a massive dose of vitamin D is indicated for the prevention and the therapy of rickets as well as for the clinical and roentgenologic differential diagnosis. Rickets is a frequent condition in certain areas of tropical countries. Its incidence in Negro infants is not greater than that in white infants.

Book Notices

Rose's Foundations of Nutrition. Revised by Grace MacLeod, Ph.D., Professor of Nutrition, and Clare Mae Taylor, Ph.D., Associate Professor of Nutrition, Teachers College, Columbia University, New York. Fourth edition. Cloth. Price, $3.75. Pp. 594, with 122 illustrations. New York: Macmillan Company, 1944.

The appearance of the fourth edition of this valuable textbook on nutrition attests the spirit in which it was originally written by the author and now is carried on by her associate, namely that of presenting the established information which is fundamental to human nutrition. To keep abreast of the rapid strides being made today in our understanding of nutrition requires such constant revision of textbook material as is found here.

The material presented in the book is developed from a rather too long discussion in the early chapters of the basic facts of nutrition such as energy metabolism and relationship of food to it, facts long since established, on which modern developments are pyramided, to subsequent consideration of the more recent and detailed contributions to the science of nutrition made by mineral and vitamin studies. In all instances the inclusion of the early background leading to the present day knowledge makes the reader appreciate the extent of our understanding of certain phases of nutrition and our limitations in other respects. The numerous striking pictures of animals which show the nutritional deficiency states make this book particularly useful for teaching purposes, as are the suggestions for further reading found at the end of each section.

Following the material treating on the factors which have been found essential for proper nutrition, practical application is made of these facts by discussing the contributions of these elements to the diet made by the various types of foods and the importance of their proper use in the nutrition of various population groups, particularly mothers and growing children. While the several basic types of foods are all covered here, it might have been better to consider them under the grouping of the seven basic food classes which is being so popularized at present and probably will have a significant effect on food thought in the future.

In presenting food values this book utilizes the unique system developed by the author of stating the food contribution in terms of shares, these being based on a unit which is a fraction of the daily requirements. Extensive tables are given for food value expressed in this manner as well as in terms of weight.

The book is one of the best of its type for teaching the fundamentals of foods and nutrition. Written in a straightforward, easily read style and well illustrated with impressionable photographs, it serves as a fine textbook in basic nutrition and reference source for food values.

Oral Pathology: A Histological, Roentgenological, and Clinical Study of the Diseases of the Teeth, Jaws, and Mouth. By Kurt H. Thoma, D.M.D., Professor of Oral Surgery and Brackett Professor of Oral Pathology, Harvard University, Boston. Second edition. Fabrikoid. Price, $15. Pp. 1,328, with 1,388 illustrations. St. Louis: C. V. Mosby Company, 1944.

This edition, issued shortly after the first, represents an increase in text to include a few of the rare diseases with the addition of new illustrations and the replacement of others. By stressing pathologic processes the author tries to create a visual picture of microscopic changes in disease and correlate them with the clinical symptoms and the roentgenologic findings. This type of descriptive approach of clinical entities, often neglected in the average textbook, is emphasized throughout and, with the profuse illustrations, furnishes an excellent reference book for the diagnostic study of the patient by the clinician, for the interpretation of the x-ray illustrations about the head by the roentgenologist, and of the biopsy about the mouth by the histopathologist.

The numerous illustrations of patients, x-ray appearances and pathologic processes are instructive and well arranged. Those in color represent color photographs and photomicrographs. In a few instances the detailed histopathologic changes are insufficiently reproduced to correspond to the descriptive text.

The first portion is concerned with hereditary, endocrine, vitamin and other nutritive influences on the development of the teeth and jaws. Systemic and local factors are discussed, with their effect on growth and structure. Functional and morbid changes under various physiologic and environmental conditions are discussed. Local experimental factors on teeth and gums is an interesting chapter. Dental caries, particularly from the investigative point of view, is well described; however, focal infection in odontogenic infection is disposed of briefly. The relationship of blood dyscrasias, deficiency diseases, metabolic disturbances, allergy and virus infection to lesions of the mouth are worthy of special emphasis.

The excellent bibliography appended at the end of each chapter includes medical as well as dental literature, together with important foreign contributions. While the book is primarily written for the dental profession, the medical practitioner will appreciate the large volume of general information that emphasizes the recent work in the investigative and pathologic phases of diseases of teeth and jaws as well as the illustrated chapters of lesions of the oral mucosa, lips and tongue. This volume will fill an important place in a medical laboratory.

Physique, Personality and Scholarship: A Cooperative Study of School Children. By R. Nevitt Sanford and others. From the Psychological Clinic, Harvard University, Cambridge, Massachusetts, and the Department of Child Hygiene, Harvard School of Public Health, Boston, Massachusetts, with the collaboration of other Departments of Harvard University. Monographs of the Society for Research in Child Development, Volume VIII, No. 1 (Serial No. 34). Paper. Pp. 705, with illustrations. Washington, D. C.: National Research Council, 1943.

This is a comprehensive study of the physical and psychologic growth and development of 48 children between the ages of 5 and 14 years. A group of investigators collaborated in this "clinical and exploratory study of the growth of the 'whole child.'" Emphasis is placed on the determination of syndromes representing meaningfully related groups of measurements, traits or other variables. The studies of personality and the environment are based on a theory of personality, "dynamic and organismic," as outlined by H. A. Murray. This concept of personality derives primarily from the works of Freud, McDougall and Allport; need as driving force is a concept basic to this theory. Relation of need to environmental force (press), evidence of need in overt behavior, the origin of needs, and changes in strength and in objects integrated with need constitute objects of this inquiry into personality structure. Numerous environmental and personality variables were exposed by reports derived from interviews with parents and teachers, by questionnaires and direct observations. Many physical observations and measurements are recorded, and a variegated battery of intellectual and personality tests were applied.

This is not a work for the clinician, educator or parent but for the research worker. Its chief value lies in the fact that it offers much opportunity for critical evaluation of research method and raises numerous possibilities for further study. As an attempt to find "some middle ground between mass statistics, on the one hand, and the purely clinical study of the individual, on the other" the work is successful. The authors are painstaking and self critical in presentation of summaries and discussions of conclusions. While this augments one's confidence in the work as a research in child development, the clinician would wish the summaries were grouped, coordinated and positively formulated in a manner that would give a clearer statement of the body of knowledge about children revealed by the study.

State Board Questions and Answers for Nurses: Essay and Objective Types. Compiled from Actual Examination Questions Given Throughout the Country by State Examining Boards. Twenty-Second edition. Cloth. Price, $3.50. Pp. 1,159. Philadelphia, London & Montreal: J. B. Lippincott Company, 1944.

This edition brings up to date a volume which has gone through twenty-two editions since 1917. It contains questions which have been asked in state board examinations throughout the country. All the fields of nursing education are covered in a well organized manner. Each question is followed by the correct answer. The answers have been reviewed by the editorial panel, consisting of competent authorities in this field. Essay type questions and objective forms are covered. There is a brief article containing useful examination suggestions and principles addressed "to the student preparing for the state

examination." Improperly used, such volumes are educationally unsound. There are the dangers of undue emphasis on examinations and the substitution of question and answer study for study based on textbooks, journals and reference volumes. Memorizing of answers may replace a sound understanding of subject matter. The editorial panel is aware of these pitfalls, and the student is advised that his goal should be a thorough knowledge rather than a passing grade. Properly used, this volume should continue to serve a useful purpose. Proper use would seem to be to "supplement your textbook review of each subject by going through the questions in this book. Do not study the answer with the question, but ask yourself the question and attempt to answer it. Check your answer with that in the book and if there is disagreement find out which is the better answer."

Out of the Test Tube. By Harry N. Holmes, Ph.D. Fourth edition. Cloth. Price, $3. Pp. 311, with 103 illustrations. New York: Emerson Books, Inc., 1943.

In an entertaining, readable manner Dr. Holmes presents the fundamentals of chemistry. The reader is introduced to each group of chemical substances or principles through historical development of man's knowledge and needs from prehistoric times. Each period of social and economic progress is marked by a noteworthy scientific discovery. Thus the cave man required only skins for clothing. The discovery of the silk fiber brought to Japan a 400,000,000 dollar export business, only to be lost by World War II and by the rise of a totally new industry based on the substitution of nitrate groups ($-NO_3$) into cellulose $(C_6H_{10}O_5)_x$. Improvements of this new rayon industry have produced an annual world production of 1,250,000,000 pounds.

Some of the more intriguing chapters are "Chemists in Crime Detection," "Shall We Have Medicines and Anesthetics to Order?" and "Have You a Chemist on Your Board?" Not to neglect present day changes, the chapters on strategic war materials and on chemistry after the war modernize this edition of an already widely read book.

As past president of the American Chemical Society, Dr. Holmes has had the opportunity to observe many chemical developments in the United States at first hand, and his able narration in a style suitable for popular reading presents an excellent opportunity to persons who may be uninformed in the fundamental aspects and applications of chemistry.

O Darvinizme. [By] I. I. Mechnikov. [Darwinism.] Sbornik statey pod redaktsiey akad. V. L. Komarova i prof. R. I. Belkina. Paper. Price, 10 rubles. Pp. 242. Moskva & Leningrad: Izdatelstvo Akademii Nauk SSSR, 1943.

Mechnikov was one of the first of the important Russian biologists to acclaim the darwinian theory of evolution. Together with his friend the noted embryologist A. O. Kovalevskiy he contributed much to the sum total of data in support of this theory by his comparative embryologic studies. This work was written in 1876 and was published seriatim in the popular magazine *Vestnik Evropy*. Its belated appearance in book form makes nevertheless fascinating reading. It reveals the talented biologist as a brilliant popularizer and propagandist of darwinism. Several chapters are devoted to a lucid discussion of the views of Bonnet, Linné, Buffon, Lamarck, Cuvier, Matthew, Johannes Mueller and other naturalists and philosophers of the 18th and 19th centuries. There are chapters on the origin of species, on darwinism and medicine, on the descent of man and an interesting account of the centenary celebration of Darwin's birth in Cambridge, at which the author spoke on behalf of the Pasteur Institute of Paris.

Otosclerosis: An Index of the Literature with Abstracts and an Index of Authors According to Subjects (Year by Year). Volume IV 1936-1942, Inc. and Future (Loose Leaf) Additions. Issued by the Central Bureau of Research, Originally the Committee on Otosclerosis of the American Otological Society, Inc. Edmund Prince Fowler, M.D., editor. Fabrikoid. Various pagination. New Bedford, Mass.: Reynolds Printing, 1943.

The purpose of this loose-leaf index to the literature on otosclerosis is to make possible ready access to the now voluminous material on this subject. The articles are classified and briefly abstracted to facilitate reference still further.

Manual of the Diseases of the Eye for Students and General Practitioners. By Charles H. May, M.D., Consulting Ophthalmologist to Bellevue, Mt. Sinai and French Hospitals, New York. Eighteenth edition, revised with the assistance of Charles A. Perera, M.D., Associate in Ophthalmology, College of Physicians and Surgeons, Medical Department of Columbia University, New York. Cloth. Price, $4. Pp. 520, with 387 illustrations. Baltimore: William Wood and Company, 1943.

The senior author of this widely known manual died in December 1943 shortly after the completion of this edition. The manual has kept to its original purpose of supplying medical students and general practitioners with essential information about the eye unaccompanied by unnecessary elaboration. The first edition appeared in August 1900; since then it has had a fantastic success. There have been numerous British editions as well as the eighteen American editions. The book has been translated into Spanish, French, Italian, Dutch, German, Japanese, Chinese, Portuguese and Urdu. The evidence is overwhelming that a manual of this type when well prepared is valued widely and persistently.

A Handbook for the Identification of Insects of Medical Importance. By John Smart, Ph.D., Assistant Keeper in the Department of Entomology, British Museum (Natural History). With Chapters on Fleas by Dr. Karl Jordan, F.R.S., and on Arachnids by R. J. Whittick, B.Sc., Assistant Keeper in the Department of Zoology. Boards. Price, 15s. Pp. 269, with 191 illustrations. London: British Museum, 1943.

This profusely illustrated book deals with the identification of arthropods of known medical importance found in Europe, Asia and Africa and the islands of the Pacific. Only passing reference is made to species found in North and South America. A few brief pages of introduction are devoted to the structure, life history and classification of insects, for it is assumed that persons using the book will have at least an elementary knowledge of the subject. The identification of each insect is given in detail, accompanied by drawings. Numerous keys to the different genera and species are very useful, while various tables are devoted to geographic distribution. An appendix contains notes on methods for collecting and preserving insects. The book is timely and should serve a useful purpose.

The Principles and Practice of Medicine: Designed for the Use of Practitioners and Students of Medicine. Originally Written by Sir William Osler, M.D., F.R.C.P., F.R.S. By Henry A. Christian, A.M., M.D., LL.D., Clinical Professor of Medicine, Tufts College Medical School, Boston. Fifteenth edition. Cloth. Price, $9.50. Pp. 1,498. New York & London: D. Appleton-Century Company, Inc., 1944.

This edition appears only eighteen months after the fourteenth or semicentennial edition. It is the third under the present editor. In the preface Dr. Christian points out that war activities have accentuated the tempo of medical progress. Great numbers who formerly lived exclusively in temperate climates are now coming in close contact with new tropical parasitical and bacterial diseases. The airplane, the rationing of food, the dissemination of venereal diseases, the development of new methods of prophylaxis and treatment all require constant reevaluation in a textbook of this kind which purports to retain its usefulness. Treatment with penicillin and the sulfonamides is discussed in as up to date a manner as could be expected. Christian's Osler remains one of the leading textbooks of medicine.

Otorrinolaringología práctica. Por los Doctores Eliseo V. Segura, profesor titular de la Facultad de ciencias médicas de Buenos Aires, Georges Cannyt, profesor titular de clínica otorrinolaringológica de la Facultad de medicina de Estrasburgo, Pedro L. Errecart, profesor titular de la Facultad de ciencias médicas de La Plata, y Atilio Viale del Carril, jefe de clínica y adscripto a la Cátedra de otorrinolaringología de la Facultad de ciencias médicas de Buenos Aires. Cloth. Pp. 1,090, with 381 illustrations. Buenos Aires: Librería Hachette S. A., Palacio del Libro, 1943.

This book is both a review of the classic methods and a presentation of the modern methods of practical value for the clinical examination of patients with otorhinolaryngologic diseases as well as for the clinical, instrumental and laboratory diagnosis and for the medical and surgical therapy of these diseases. The book consists of seven parts in which these subjects in diseases of the pharynx, larynx, trachea, esophagus, nose, paranasal sinuses and the ear are thoroughly discussed in many chapters. The illustrations are clear. The book is well prepared and is of real practical value both to practicing physicians and to otorhinolaryngologists.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ALLERGY TO MULTIPLE FOODS

To the Editor:—A boy aged 12 years is allergic to many foods, including wheat and rye; he is also moderately allergic to corn. This makes him quite a difficult case, since eating of bread precipitates an attack. Is there any way of desensitizing him against these substances? Is there any blanket desensitization such as large amounts of vitamin C? He has been tested with the Barkos method and found allergic to the following foods, including most of the pollens: orange, raisin, pineapple, prunes, oats, milk (1 plus), rice, rye, wheat, corn (1 plus); the control (saline) has been negative.

Morris Waxgiser, M.D., Brooklyn.

ANSWER.—A positive skin reaction to foods does not necessarily signify that the patient is clinically sensitive to all of them. It is necessary that the clinical import of these various foods be ascertained by their elimination and subsequent systematic addition to the diet. If he is found sensitive to several foods, the procedure should be as follows: The relatively unimportant foods, such as pineapple, prunes, rice and rye, can be entirely eliminated. Frequently tolerance to these foods can be established after a period of months or years by this process alone. In instances of moderate degrees of sensitivity, tolerance can be established by this method also in the case of the more important foods, such as wheat and milk. In cases of severe sensitivity such effects are not obtainable by mere avoidance. In all cases more rapid and more certain results can be obtained by active methods of desensitization. This consists, in principle, of oral daily administrations of minute but increasing doses of the food until a normal amount can be tolerated. In the average case this requires about five or six months. The beginning doses and the rate of increase will vary, of course, with the individual's grade of sensitivity. The procedure in the average instance of allergy to wheat would be about as follows: The first series of doses may be in the form of suspensions of flour in water. A teaspoon of wheat flour is thoroughly mixed with a glass of water. The first doses of this mixture taken twice daily are as follows: 1 drop, 2, 3, 4, 5, 6, 8, 10, 15, 20 drops, ½ teaspoon, ¾, 1, 2, 3 and 4 teaspoons. From that point on puffed wheat grains may be used in the following daily doses: 1, 2, 3, 4, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 25, 30. From then on one may use level teaspoons of the puffed wheat as follows: 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 8, 9, 10, 11, 12. After that the doses may be measured in terms of square inches of bread slices, such as ½, ¾, 1, 1½, 2, 2½, 3, 3½, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16. After a dose of 1 slice of bread is reached, wheat in other forms can be gradually added.

None of the so-called blanket desensitization methods, such as vitamin C, D, B_1, histamine or histaminase, have been found to be effective in the hands of most competent observers.

CLIMATIC AND HYGIENIC CONDITIONS IN BRAZIL

To the Editor:—Would you let me know the sanitary, climatic and other health factors in Brazil in the sections about Sao Paulo and Rio de Janeiro? I would also appreciate any reference you might give me as to where these subjects might be gone into in detail.

M.D., New York.

ANSWER.—The state of São Paulo and Rio de Janeiro are the most heavily populated regions of Brazil. They are provided with most of the modern developments and facilities. Sanitary and hygienic conditions are excellent in the capitals, less so in distant areas, especially on the western side. Water supply, sewerage system, milk and food care are, as a rule, modern and adequate. Climatic conditions vary in different parts of the states. In the littoral the climate generally is semitropical. As high temperatures, rainfall and humidity are favorable to the existence of many parasites, endemic parasitic diseases such as malaria, ancylostomiasis, typhus and amebiasis are found in those regions. Infestation, as a rule, is absent or only moderate in the plateau zones. However, the damming of great bodies of water in the warm season produces favorable habitats for the development of certain parasites such as Anopheles darlingi, with consequent endemic spreads of malaria. Detailed literature on the subject may be found in "Arquivos de higiene" and "Arquivos de higiene e saude publica, São Paulo."

CHRONIC COUGH AND HYPERTENSION

To the Editor:—I should like to know if a severe attack of pneumonia and its sequels which may become chronic, such as chronic respiratory weakness, infection of the upper air passages and inflammation of the lower respiratory system, have any proximate cause or influence on the production of hypertension in a person later in life, especially when he is predisposed to the development of general arteriosclerosis. This patient had a right lower lobar pneumonia which left him on recovery with chronic bronchitis associated with a chronic cough. He is also of pyknic constitution and cyclic emotional personality, which predisposes him to arteriosclerosis. The question is Does the chronic cough resulting from the pneumonia have any influence in the development of elevated blood pressure, especially when the individual is predisposed to arteriosclerosis anyway? Can you refer me to some book or monograph?

Allan E. Lee, M.D., Washington, D. C.

ANSWER.—Relationship between chronic cough from pneumonia, bronchitis or bronchiectasis and the development of hypertensive arterial disease has not been demonstrated. Chronic fibrotic bronchitis and bronchiectasis may well be factors increasing the circulatory resistance in the lesser (pulmonary) circulation and thus etiologically significant in right ventricular hypertrophy (Brenner, O.: Pathology of the Vessels of the Pulmonary Circulation, *Arch. Int. Med.* **56**:976 [Nov.] 1935. Brill, I. C., and Krygier, J. J.: Primary Pulmonary Vascular Sclerosis, *ibid.* **68**:560 [Sept.] 1941).

Coughing causes a considerable, but briefly transient, rise in the systemic blood pressure (Battro, A.; González Segura, R.; Eliçabe, C. A., and Araya, E.: Influence of Respiration on Blood Pressure in Man, *ibid.* **73**:29 [Jan.] 1944), but this does not imply, or even suggest, that chronic cough tends to induce hypertensive disease. The psychosomatic influences of the tensely emotional personality mentioned are much more likely to be etiologically significant than the chronic cough. It is quite possible that the cough is aggravated and continued by a low grade cardiac incompetence, with slight fluid accumulation in the pulmonary bases. A good recent summary of the present understanding of the etiology and pathogenesis of hypertensive arterial disease is to be found in chapter 31 of Stieglitz, E. J.: Geriatric Medicine, Philadelphia, W. B. Saunders Company, 1943.

VEGETABLE SHORTENINGS, MARGARINES AND BUTTER

To the Editor:—Please let me know the digestibility of the oils in the vegetable shortenings such as Crisco and Spry, and oleomargarines, especially in comparison with butter. You might include other comparisons with butter, such as vitamin content in different seasons.

M.D., New York.

ANSWER.—The digestibility of the proprietary vegetable shortenings and the margarines compares favorably with the digestibility of butter fat. The opinion formerly prevailed that the ease of absorption of a fat depended on its melting point, the higher the melting point the less well absorbed. This is now considered to be untrue. The digestibility appears to depend more on the degree of unsaturation of the fatty acids and the shortness of the carbon chains of these acids.

Shortenings and margarines have melting points of about 115 and 95 F. respectively and are made of various proportions of hydrogenated and unhydrogenated vegetable fats. Feeding studies on animals show that their nutritional value is essentially the same as that of the animal butter fat. They also appear to fulfil growth requirements equally well. In a study on human beings several highly hydrogenated vegetable oils with melting points above 120 F. gave digestibility coefficients averaging 90.0 as compared to 97.8 for butter. The ordinary commercial products are not as completely hydrogenated as the fats used in this work.

The processed vegetable oils contain no vitamin A. In the case of margarine, most brands now have 9,000 units of vitamin A added per pound. Average butter contains 12,000 units per pound, with a somewhat higher value found in summer butter.

GONADOTROPINS AND SPERMATOGENESIS

To the Editor:—I would appreciate information on glandular products which have resulted in improving spermatogenesis.

M. C., U. S. Army.

ANSWER.—There is at the present time a difference of opinion as to whether chorionic, pituitary or equine gonadotropins increase spermatogenesis in man. Two recent references concerning the effect of these hormones in human spermatogenesis are:

Davis, C. D.; Pullen, R. L.; Madden, J. H. M., and Hamblen, E. C.: Therapy of Seminal Inadequacy, *J. Clin. Endocrinol.* **3**: 268 (May) 1943.

Pullen, R. L.; Wilson, J. A.; Hamblen, E. C., and Cuyler, W. K.: Clinical Reviews in Andrologic Endocrinology: Treatment of Seminal Failure, *ibid.* **2**: 730 (Dec.) 1942.